

JOURNAL of the American Veterinary Medical Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

EDITED AND PUBLISHED FOR

The American Veterinary Medical Association

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JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit, Mich.

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SOMETHING WORTHWHILE

In the list of applications for membership in the A. V. M. A. published in this issue of the JOURNAL, will be found the name of Dr. Harold J. Classick. When his application was received, through Dean Stange, it was accompanied by a check for \$25.00. It is quite likely that this is the largest check that has ever accompanied an application for membership in the American Veterinary Medical Association.

The check in question was signed by Mr. George Judisch, of Ames, Iowa, a name that is familiar to all graduates of the Division of Veterinary Medicine of Iowa State College, as well as to many other veterinarians throughout the Central West. For twenty-six years, Mr. Judisch was a member of the veterinary faculty of Iowa State College and upon his leaving the institution, a few years ago, he was awarded a certificate for twenty-five years of honorable service, from the College. Mr. Judisch is now confining his efforts to the operation of his drug store, in Ames, as well as to the work of the Iowa State Pharmacn Commission, of which he has been a member for several years.

In the goodness of his heart and with a desire to do something that would be worthwhile, Mr. Judisch has offered a prize to the

best student in the Division of Veterinary Medicine, at Ames. This prize has a cash value of \$25.00 and is sufficient to cover the initiation fee in the American Veterinary Medical Association and dues for three years, including subscription to the JOURNAL. In other words, the check for \$25.00, which accompanied the application of Dr. Classick, will take care of his membership fee and dues for the year 1927, as well as for the three years following—1928, 1929 and 1930. Certainly a prize worth striving for.

Quoting Dean Stange, in a letter conveying information relative to the offering and the award of the prize:

It is being offered by Mr. Judisch as a sort of an extension of the student's education. Something that will be of material assistance in getting him started along the right path after graduation. It is believed that it will also help to emphasize, to the other students, the value placed on membership in the American Veterinary Medical Association and the reading of veterinary literature.

If this article should come to the notice of someone who desires to help a worthy cause, the establishment of a similar prize in some one of the other veterinary colleges would be a very fine thing.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***

THIS MEANS YOU

Blue Pencil This and Take It Home for Your Wife To Read

We want you, A. V. M. A. member—and your wife, or mother or daughter—to know, if you do not already, that there is a Women's Auxiliary to the A. V. M. A. You may suspect that our purpose is to band together to inveigle the men to take us to the annual meetings of the Association. Not true! But we do not hesitate to tell the ladies to record the time and place for the 1927 meeting: Philadelphia, September 13-16. Our purpose really is to render worthwhile service to the profession, by giving financial assistance to worthy veterinary students. No woman could resist the appeal of these outstanding students, could she know the individual cases. Yet each year we lack funds for several such cases. We need the cooperation and support of every woman to help us with the Student Loan Fund. If this work appeals to you, we will gladly lend your annual dues of one dollar to some ambitious student, and then when he pays

off his loan, we will re-lend it and so on, in endless chain. We want every veterinarian's lady to be an Auxiliary member. This is an invitation. Act now. Membership fee and dues for the first year amount to \$1.50. After you join, it takes only one dollar per year to do your share. Our secretary is Mrs. S. E. Hershey, 1109 Washington Street, Charleston, West Virginia.

H. H. B.

***See Philadelphia—September 13-14-15-16.
Rich in History; active in Industry;
Renowned in Medical Science***

EXECUTIVE BOARD ELECTION

The election of a member of the Executive Board to represent District No. 1 (Canada) is still in progress. About 75 per cent of the Canadian members eligible to vote have cast their ballots. These are pretty well distributed among the seven candidates. One-fourth of the ballots have not been returned. These should be mailed so as to reach Detroit not later than July 16, 1927, on which date the polls will be closed. Canadian members will not have another chance to vote for their representative on the Board for five years. If you have not voted, do so at once.

***Attend the meeting in Philadelphia,
September 13-14-15-16,
Where many things began and the best continue***

MORE ABOUT VETERINARY MEETINGS

A question which continually engages the attention of several hundred veterinarians, individually as well as collectively, is in connection with the proper form or arrangement of programs for veterinary gatherings of one kind or another, including association meetings, conferences, so-called short courses and so forth. It is no unusual occurrence for the secretary of some veterinary association to write to the Editor and ask for assistance in arranging the program for a coming meeting of his organization.

The publication, in the JOURNAL, of reports of upwards of one hundred meetings held throughout the country in the course of a year brings a number of inquiries to the office relative to the programs of these meetings. Further information is wanted concerning certain arrangements of these programs. We are

pleased to act as a sort of clearing-house in this capacity and we never pass up an opportunity to collect information whenever we hear of a new idea going over.

The adoption of a new form of veterinary short course at the Iowa State College, several months ago, gave rise to some correspondence with Dean Stange and we can do no better than quote from one of his letters, in which he comments upon present-day problems in connection with the matter under discussion.

The tendency to offer short courses and practitioners' courses seems to be increasing and not only are many of the veterinary schools offering these courses but some of the agricultural colleges have also become interested. Iowa State College began giving these courses in 1913 and after this fourteen years of experience with them, we have adopted a system of limiting the number in attendance and offering the practical as well as the technical work. We owe it to the members of the veterinary profession, not only to keep abreast of the times in teaching our undergraduates, but we should provide opportunity for those older in the profession to familiarize themselves with the new ideas and methods. The busy practitioner relies very largely on journals and association meetings, which are of great benefit, but when it comes to the adoption of new methods which require change in technic, or some laboratory exercise, in order to insure that the thought is instilled into the minds of the men and that they have the confidence to apply them when they return to their practice, it requires practical exercises.

The first course of the kind described by Dean Stange was completed this spring, along the lines of breeding diseases of cattle, and the veterinary faculty, with the able assistance of Dr. C. P. Fitch, of the University of Minnesota, gave the lectures, laboratory exercises and conducted the clinic. We understand that an outline of this course is available in printed form and undoubtedly a copy can be secured, by any veterinarian who is interested, by writing to Dean Stange.

There is a certain advantage in having large audiences at veterinary meetings, but, on the other hand, there is a disadvantage which it is difficult to overcome, unless the size of the audience is limited. This is the feature of the new courses at Ames. Dean Stange is convinced that it is the only way in which veterinarians can secure the information desired and at the same time secure confidence to put new methods into practice when they arrive home. The old method of literally "talking the men to death" in the classroom does not accomplish the things that are desired by a long way.

Dean White, of Ohio State University, has some rather clearly defined ideas on what is the proper function of a state veterinary medical association meeting. Although he arrives at substantially the same conclusion, Dean White has a different starting-point from Dean Stange, who states what a veterinary short

course should be and Dean White says what a veterinary association meeting should *not* be. The latter believes in segregating to the short course those things which are purely didactic and leaving the meetings for the discussion of matters pertaining to organization, questions concerning policies, and—last but not least—politics.

Quoting from an address delivered by Dean White, before the fourth annual conference for veterinarians, held at New Brunswick, N. J., in January:

there should be no conflict between the state veterinary association and the conference. Their functions, as it has worked itself out, are not the same. The state meeting should emphasize the social, political, regulatory and policy-forming sides of the profession; the conference the educational. There is plenty of room for both. Furthermore, the tax-supported schools owe something to those who support them. The live stock industry is entitled to some dividends on the investment. Through the annual veterinary conference these dividends can be declared and through the local veterinarians wisely distributed among those engaged in this industry. Ultimately the effect will be to produce a more and more efficient group of veterinary practitioners who can render a better service, and a better service will bring its reward to the veterinarians in greater income and influence. The future demands much more of us than has the past. The practitioner of my younger days was crude in comparison with the better educated, better trained young veterinarian of today. A profession cannot stand still; it must go forward or go backward. Our future is brighter than our past, but it will be entirely different, demanding much more of us, sometimes more perhaps than we can give. We cannot hope to render a service 100 per cent efficient but we shall try to approach it. One of the devices most helpful in this regard will be these yearly get-togethers at the state seat of learning in applied science where we may discuss our problems, learn something new or a new way of doing something old, return home and apply it, thus helping the live stock industry of the state and at the same time helping ourselves and our profession.

***Meet thy friends in the Friendly City—
Philadelphia, September 13-14-15-16***

FREE VETERINARY ADVICE

Our British confrères apparently have to contend with some of the same encroachments upon private veterinary practice that American veterinarians have been experiencing for some time. Among these so-called encroachments may be mentioned the veterinary columns conducted by some agricultural papers. There may have been a time when these columns answered a useful purpose. Back in the early days, when qualified veterinarians were few and far between, these columns afforded the only way in which some owners of live stock could get information relative to animal diseases. At the present time, however, this condition holds to only a very limited extent and we really see very little use for the continuance of the majority of these veter-

inary columns, even though the maintenance of them may mean a few dollars in the pockets of the veterinarians who conduct them.

Several years ago, we approached the editor of one of our well-known farm papers and asked him why it was that his paper continued to run a veterinary column. He promptly and freely acknowledged that there really was little use for it nowadays, but it was simply a question of competition. He went on to say that practically all farm papers carried such columns and that his publication would be at a distinct disadvantage, if he were to discontinue the veterinary column in it. The editor said that it was a talking-point for those whose business it was to solicit subscriptions for his paper, but at the same time he said that if other farm papers would agree to discontinue their veterinary columns, he would be one of the first to fall in line.

The following brief communication, under the caption, "That Iron Lid!" appeared in a recent issue of the *Veterinary Record* (London): "One more nail in the coffin of the poor practitioner." The writer referred to a clipping, "Veterinary Advice," which he enclosed, taken from the *Farmer and Stockbreeder*. It read:

"I have obtained many valuable hints from 'Vet's' contributions to your columns and answers to correspondents. I would suggest that other readers adopt my plan of cutting out every prescription of special interest and pasting it in a note book for future reference. I number each prescription, and then get a reliable chemist to make up the mixture. The bottle is numbered to correspond with the number of the particular prescription in the notebook; and by this means I am able to find in the medicine cupboard a remedy for almost any ailment at a moment's notice. I used to pay from £15 to £20 a year for veterinary advice, but since I accumulated 'Vet's' prescriptions in this way I never call in a veterinary surgeon and have better results."

We have absolutely no fault to find with the kind of veterinary information given the readers of some farm papers. Articles written in non-technical language on prevalent infectious and contagious diseases, dealing with their nature, mode of spread, means of prevention and similar pertinent information are to be commended, when prepared by competent authorities. We do condemn, however, the all-too-common custom of long-distance diagnosing and prescribing, in individual cases of disease. Too often the time elapsing, before the advice is received by mail, has been such as to preclude the possibility of a cure, even if the veterinary editor has been fortunate enough to make a correct diagnosis. Then, as such things go, the local practitioner is called in, when the patient is at death's door, and is expected to pull him through.

ON TO PHILADELPHIA

The members of the Local Committee on Arrangements for the Philadelphia meeting are bending every effort to make the 1927 convention of the American Veterinary Medical Association a memorable one. Nothing will be left undone to provide for the comfort and convenience of the veterinarians and members of their families, who will join the pilgrimage to the Quaker City in September. As pointed out on several previous occasions, the meeting this year will be the first one to be held inside the United States, east of the Mississippi River and north of the Ohio River, since 1920, when we met in Columbus, Ohio. This is a rather large territory and, considering the density of the veterinary population in the states comprising this district, for many it has been a long wait for a meeting of the A. V. M. A. Such being the case, it is a foregone conclusion that the attendance at Philadelphia will be large.

The veterinarians of the Quaker City and vicinity know how to entertain. Philadelphia was host to the Association in 1908 and again in 1918. A number of the members of the present Committee on Arrangements having served in a similar capacity before, the Philadelphia veterinarians have a big advantage, by reason of this previous experience in handling a convention. The four groups of section officers are now in the midst of putting the finishing touches on their respective programs. We have been in close touch with these men and do not hesitate to say, at this time, that the literary program at Philadelphia will be up to the usual high standard of recent years. These programs are unusually well-balanced and there will be something to interest every veterinarian in attendance, no matter in what branch of the profession he may be engaged.

On to Philadelphia!

***Thee and thine to the City of Penn;
Forget not when—September 13-14-15-16***

INJURED VETERINARIANS RECOVERING

Latest reports from President Sigler and ex-President Welch are to the effect that both are recovering from the injuries they received in an automobile accident the latter part of May. President Sigler was experiencing soreness in the region of his sternum, three weeks after the accident. Dr. Welch was con-

fined to the hospital for three weeks and one day, with six ribs broken and his collar bone fractured in two places. Dr. Koen was so badly upset that he was unable to tend to business for about three weeks, but was back on the job June 13. All have the best wishes of their many friends for complete recoveries.

***Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16***

PRESIDENT SIGLER HURT AGAIN

Dr. T. A. Sigler, president of the A. V. M. A., met with his third accident, within a comparatively short period of time, Friday morning, June 17, when he suffered a fractured collar-bone in an automobile crash. Dr. Sigler was with Dr. Frank H. Brown, state veterinarian of Indiana, and Dr. R. C. Julien, former state veterinarian, in the latter's car. They were following a truck, on the National Road, near Belleville, Ind., when the truck suddenly turned into a side road and Dr. Julien's car crashed into it. Dr. Sigler was the only one of the trio to suffer serious injury. Besides the broken collar-bone, he received several bad cuts and bruises. He will be confined to the hospital, in Greencastle, for several weeks.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***

APPLICATIONS FOR MEMBERSHIP

See April, 1927, JOURNAL

FIRST LISTING

- | | | |
|---|---|-------------------|
| ADDIS, CLARKSON | V. M. D., University of Pennsylvania, 1917 | Collegeville, Pa. |
| Vouchers: G. A. Dick and Louis A. Klein. | | |
| ARPKE, RAYMOND H. | Iowa State College, Ames, Iowa. | |
| | D. V. M., Iowa State College, 1927 | |
| Vouchers: C. H. Covault and W. F. Guard. | | |
| BAILEY, JOHN GROFF | 711 E. Broadway, Milton, Pa. | |
| | V. M. D., University of Pennsylvania, 1917 | |
| Vouchers: E. P. Althouse and T. E. Munce. | | |
| BLACK, WILLIAM L. | | Sonora, Texas |
| | D. V. M., Colorado Agricultural College, 1924 | |
| Vouchers: Mark Francis and R. P. Marsteller. | | |
| BROCKETT, FRED JOHN | Michigan State College, East Lansing, Mich. | |
| | D. V. M., Michigan State College, 1927 | |
| Vouchers: B. J. Killham and Ward Giltner. | | |
| BROWN, ALBERT LYLE | 104 Second St., Deposit, N. Y. | |
| | D. V. M., Cornell University, 1915 | |
| Vouchers: F. D. Holford and Roy H. Spaulding. | | |

- BRYANT, MAYNARD L. 43 Summer St., Montpelier, Vt.
D. V. M., Cornell University, 1921
Vouchers: L. H. Adams and V. A. Moore.
- CHANDLER, FRED H. 70 West Main St., Miners Mills, Pa.
V. M. D., University of Pennsylvania, 1910
Vouchers: Thos. D. James and Louis A. Klein.
- CLASSICK, HAROLD J. Iowa State College, Ames, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: H. E. Bemis and W. F. Guard.
- DAVISSON, LEE R. F. D. No. 2, Manchester, Mich.
M. D. C., Chicago Veterinary College, 1910
Vouchers: B. J. Killham and T. S. Rich.
- DAYTON, ROLAND C. 4709 Lancaster Ave., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1920
Vouchers: G. A. Dick and C. J. Marshall.
- DEMSEY, H. W. Huntington, Ind.
D. V. M., Indiana Veterinary College, 1914
Vouchers: T. A. Sigler and F. J. Muecke
- DEVITA, JOSEPH 621 Chapel St., New Haven, Conn.
V. M. D., University of Pennsylvania, 1916
Vouchers: James J. Flaherty and E. T. Booth.
- DOUGLASS, OLIVER T. 2728 Boone St., Ames, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- ELLIOT, THOMAS A. Genesee, Idaho.
D. V. M., State College of Washington, 1914
Vouchers: W. A. Sullivan and F. W. Close.
- FULLER, WILLIS DOTY Drawer 575, Somerset, Pa.
V. M. D., University of Pennsylvania, 1903
Vouchers: G. A. Dick and C. J. Marshall.
- GALBRAITH, ALBERT C. Newville, Pa.
D. V. M., Kansas City Veterinary College, 1915
Vouchers: G. A. Dick and C. J. Marshall.
- GRAUCH, CHARLES J. 38 Arbutus Ave., Pitman, N. J.
V. M. D. University of Pennsylvania, 1906
Vouchers: Henry H. Haigh and E. T. Booth.
- GRIFFITH, JOHN JAMES 109 Boylston St., Bradford, Pa.
V. M. D., University of Pennsylvania, 1910
Vouchers: G. A. Dick and Louis A. Klein.
- HARBAUGH, FRED GEORGE Iowa State College, Ames, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- HARTMAN, GULDIN R. 914 N. 15th St., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1888
Vouchers: Wm. J. Lentz and Louis A. Klein.
- HAWN, M. C. 1130 Elm St., Webster City, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- HENCH, CHARLES MARTIN 127 S. Cumberland St., Waynesburg, Pa.
V. M. D., University of Pennsylvania, 1903
Vouchers: G. A. Dick and C. J. Marshall.
- JOHANSEN, E. WILLIAM Vet. Clinic, O. S. U., Columbus, Ohio.
D. V. M., Ohio State University, 1927
Vouchers: Leonard W. Goss and J. N. Shoemaker
- JONES, FRANK EDWARD 91 Plum St., Greenville, Pa.
D. V. M., Ohio State University, 1912
Vouchers: G. A. Dick and C. J. Marshall.

- KOHLER, DANIEL R. Boyertown, Pa.
V. S., Ontario Veterinary College, 1893
Vouchers: G. A. Dick and C. J. Marshall.
- LAWRENCE, CHARLES CURTIS Griswold, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- LEIGHOW, GEORGE M. Bloom Road, Danville, Pa.
V. M. D., University of Pennsylvania, 1927
Vouchers: G. A. Dick and Louis A. Klein.
- MCCARTHY, PHILIP JAMES 30 W. Gravers Lane, Chestnut Hill, Phila., Pa.
V. M. D., University of Pennsylvania, 1914
Vouchers: G. A. Dick and C. J. Marshall.
- MC ELWEE, ELLSWORTH New Albany, Ohio
D. V. M., Ohio State University, 1927
Vouchers: Leonard W. Goss and J. N. Shoemaker
- McKIBBIN, ROBERT WEBBER 216 W. 2nd St., Waynesboro, Pa.
V. S., Ontario Veterinary College, 1895
Vouchers: G. A. Dick and C. J. Marshall.
- MARTIN, A. S. Box 309, Moscow, Idaho
D. V. M., Kansas City Veterinary College, 1917
Vouchers: W. A. Sullivan and J. E. Ellis.
- MASSINGER, CHARLES EBER 805 Main St., Phoenixville, Pa.
V. M. D., University of Pennsylvania, 1927
Vouchers: G. A. Dick and C. J. Marshall.
- MASSINGER, EBER MICHENER 805 Main St., Phoenixville, Pa.
D. V. S., New York College of Veterinary Surgeons, 1891
Vouchers: G. A. Dick and C. J. Marshall.
- MOORE, STEVENSON, JR. Univ. of Pennsylvania, Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1927
Vouchers: Louis A. Klein and G. A. Dick.
- PAS, HAROLD H. Orange City, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- PETERSON, LYNN ALLEN Lewiston, Pa.
V. M. D., University of Pennsylvania, 1927
Vouchers: Louis A. Klein and G. A. Dick.
- POWELL, ARTHUR JAMES Lewiston, Idaho.
D. V. S., State College of Washington, 1911
Vouchers: W. A. Sullivan and W. E. Neary.
- RILE, FREDERICK C. Owingsville, Ky.
D. V. M., U. S. College of Veterinary Surgeons, 1920
Vouchers: T. P. Polk and C. G. Kreidler
- SKINNER, CHARLES BAILEY 86 E. Main St., Cobleskill, N. Y.
D. V. M., Cornell University, 1914
Vouchers: F. D. Holford and H. W. Naylor.
- SMITH, G. O. Ligonier, Ind.
V. S., Ontario Veterinary College, 1900
Vouchers: R. C. Julien, T. A. Sigler and F. J. Muecke.
- SMITH, GEORGE T. 224 Water St., Hughesville, Pa.
V. M. D., University of Pennsylvania, 1910
Vouchers: C. J. Marshall and Louis A. Klein.
- VANSANT, ALLEN STEARNE Fox Chase, Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1927
Vouchers: G. A. Dick and C. J. Marshall.
- WALLACE, W. B. 220 W. 2nd St., Marion, Ind.
V. S., Ontario Veterinary College, 1887
Vouchers: H. W. Brown, T. A. Sigler and F. J. Muecke.

- WEBB, J. ALEXANDER V. M. D., University of Pennsylvania, 1916 Avondale, Pa.
Vouchers: G. A. Dick and Louis A. Klein.
- WEHR, GRANT A. V. S., Ontario Veterinary College, 1896 M. D. V., McKillip Veterinary College, 1899 Denver, Pa.
Vouchers: G. A. Dick and Frank U. Fernsler.
- WELSH, WILLIAM EDWARD Iowa State College, Ames, Iowa.
D. V. M., Iowa State College, 1927
Vouchers: C. H. Covault and W. F. Guard.
- WHIPPLE, RAY O. 226 S. 3rd St., Lemoyne, Pa.
V. M. D., University of Pennsylvania, 1916
Vouchers: G. A. Dick and Louis A. Klein.
- WHITE, WALTER G. 116 W. Baltimore Ave., Lansdowne, Pa.
V. M. D., University of Pennsylvania, 1909
Vouchers: G. A. Dick and C. J. Marshall.
- WILES, SHELTON 428 E. Washington Blvd., Fort Wayne, Ind.
D. V. M., Indiana Veterinary College, 1917
Vouchers: Geo. W. Gillie, T. A. Sigler and F. J. Muecke.

Application Pending

SECOND LISTING

- Copland, Alex. L., Grosse Pointe Farms, Mich.
Cunningham, James Joseph, 1537 Overington St., Frankford, Philadelphia, Pa.
Finck, Victor Harry, Elizabeth City, N. C.
Graves, Hobson William, Box 341, Union S. C.
Hamilton, Cecil Morley, 2045 Third Ave., Detroit, Mich.
Hogg, James S., 161 Pine St., Oxford, Pa.
MacDonald, Harold Stewart Claude, 2045 Third Ave., Detroit, Mich.
McLellan, David John, 51 Enterprise St., Moncton, N. B.
Phillips, E. S., Ingalls, N. C.
Rosenberger, John Newton, 749 S. 51st St., Philadelphia, Pa.
Turrell, Charles Willard, Arabi, La.
Watson, Harold L., 159 Main St., Montpelier, Vt.

REINSTATED

- Pigman, E. G., Box 446, Sandpoint, Idaho.
Smith, Wright J., 260 Clinton Ave., Kingston, N. Y.

The amount that shall accompany an application filed this month is \$7.50, which covers membership fee and dues to January 1, 1928, including subscription to the JOURNAL.

***Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16***

COMING VETERINARY MEETINGS

- Oklahoma State Veterinary Medical Association. Skirvin Hotel,
Oklahoma City, Okla. July 11-12, 1927. Dr. Frank R. Knotts,
Secretary, Stillwater, Okla.
- Missouri Valley Veterinary Association. Elks Club, Omaha,
Nebr. July 11-13, 1927. Dr. E. R. Steel, Secretary, 8102
Walnut St., Kansas City, Mo.
- Maine Veterinary Medical Association. Augusta, Me. July 13,
1927. Dr. C. F. French, Secretary, Rockland, Me.

- North Dakota Veterinary Medical Association. Fargo, N. D. July 13-14, 1927. Dr. H. L. Foust, Secretary, State College, Fargo, N. D.
- Western New York Veterinary Medical Association. Buffalo, N. Y. July 14, 1927. Dr. F. F. Fehr, Secretary, 243 S. Elmwood Ave., Buffalo, N. Y.
- Virginia State Veterinary Medical Association. Ocean View, Va. July 14-15, 1927. Dr. W. H. Ellett, Secretary, Midlothian, Va.
- Minnesota State Veterinary Medical Association. University Farm, St. Paul, Minn. July 14-15, 1927. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.
- Wisconsin Veterinary Medical Association. Oshkosh, Wis. July 18-19, 1927. Dr. B. A. Beach, Secretary, University of Wisconsin, Madison, Wis.
- South Carolina Association of Veterinarians. Spartanburg, S. C. July 19-20, 1927. Dr. M. R. Blackstock, Secretary, 157 Hampton Ave., Spartanburg, S. C.
- Illinois State Veterinary Medical Association. Bloomington, Ill. July 20-21, 1927. Dr. W. H. Welch, Secretary, Lexington, Ill.
- Maryland State Veterinary Medical Association. University of Maryland, College Park, Md. July 21-22, 1927. Dr. E. M. Pickens, Secretary, College Park, Md.
- Connecticut Veterinary Medical Association. Connecticut Agricultural College, Storrs, Conn. July 22, 1927. Dr. G. E. Corwin, Secretary, 11 Warrenton Ave., Hartford, Conn.
- Missouri Veterinary Medical Association. Fulton, Mo. July 27-28-29, 1927. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.
- Montana Veterinary Medical Association. Helena, Mont. July 28-29, 1927. Dr. Hadleigh Marsh, Secretary, Livestock Sanitary Board, Helena, Mont.
- Hudson Valley Veterinary Medical Society. Kenozia Lake Club, Ashokan Dam, N. Y. August 10, 1927. Dr. Wm. Henry Kelly, Secretary, 233 Western Ave., Albany, N. Y.
- Ontario Veterinary Association. Ontario Veterinary College, Guelph, Ont. Aug. 16-17, 1927. Dr. H. M. Le Gard, Secretary, 223 Main St. N., Weston, Ont.
- American Veterinary Medical Association. Bellevue-Stratford Hotel, Philadelphia, Pa. Sept. 13-14-15-16, 1927. Dr. H. Preston Hoskins, Secretary, 716 Book Bldg., Detroit, Mich.

ANATOMICAL CHANGES IN LAMENESSES OF THE HORSE*

*By R. R. DYKSTRA, Dean, Division of Veterinary Medicine,
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It has been repeatedly stated that veterinary practice has undergone remarkable changes during recent years, and a potent influence in this matter is the very extensive displacement of the driving horse by the automobile. Lamenesses were always commonest in driving horses, followed next by draft horses used on city streets, and as mechanical motive power has to a considerable extent eliminated these types of horses, therefore an important change in veterinary practice is the comparatively small number of lame animals we are called upon to treat. Horses in rural communities, and particularly these animals that seldom leave the farm, are not usually susceptible to lameness. They live under natural conditions. Some of them are never shod. Very few of them are ever called upon to exert themselves at maximum speeds. They are not called upon to travel over paved streets. It is these conditions that limit lameness of the horse as a factor in the veterinarian's practice. In this section of the country where horses are still extensively produced, either for riding or racing purposes, diseases of the limbs resulting in lameness are said to be quite common.

In this presentation the subject will be approached from two viewpoints, depending upon the nature of the tissue involved. The two main headings are as follows:

- I. Diseases of soft tissues.
- II. Diseases of hard tissues.

I. Diseases of Soft Tissues

Those most commonly observed involving the regions of the tarsus or carpus or below are as follows:

- Tendinitis
- Synovitis
- Tendo-synovitis.

TENDINITIS

This condition, because of the swelling existing in the tendons, is commonly spoken of by horsemen as "bowed tendons." It may be ascribed to both predisposing and exciting causes.

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Predisposing causes are those conformations which tend to place unusual strain upon the flexor tendons. This is especially true in the case of those animals that have very sloping pasterns. We have seen it and ascribed it to a tendency of some saddle-horse conditioners to permit the toe of the hoof to grow exceedingly long, the heel, on the other hand, being more than ordinarily low. Saddle-horse conditioners do this so that the animal may be ridden without violent shock or discomfort to the rider. Such conditions, while pleasing to the rider, are nevertheless harmful to the animal. Another predisposing factor is observed in those animals in which there is extreme narrowness of the region immediately below the carpus as viewed in profile.

Exciting causes are those excessive strains to which trotting, running, or jumping horses are exposed. Virtually the entire weight of the animal falls upon one limb or another at the moment of violent contact with the ground, and if this is complicated by a predisposing conformation, it is bound to result in injury to the flexor apparatus.

Probably the initial injury consists in a partial rupture of the fibers of the tendon, together with a mild extravasation of blood, or of a sero-sanguinous fluid in the interfascicular connective tissue. This is followed almost immediately by an inflammatory reaction, characterized by all the cardinal symptoms of inflammation, such as heat, pain, swelling, etc. It is during this stage that there is formed in the diseased tissue, new connective and granulation tissue originating from the peritendineum, adjacent tendon sheaths, and from the interfascicular tissue. Some new tissue originates from the tendon cells of the ruptured tendon fiber. In the course of time this new tissue becomes hard, nodular, and may contract considerably, so as to lift the animal's heel from its normal position, and at the same time it may contract extensive adhesions with its tendon sheaths.

If the animal has any value at all, veterinarians may be called to treat it during the early stages, but it is not uncommon to delay treatment until organization has taken place in the diseased tendon. Clinically the condition does not differ materially in its symptomatology from what one would expect from an inflammation of any structure. Depending upon the extent of the injury, the degree of swelling and pain vary considerably. At times the swelling is so intense that the designation "bowed tendon" is well deserved. In the later stages lameness may or

may not be present, the swelling is less severe, though upon palpation the tendon imparts a more knotted sensation.

It is not the purpose of this paper to deal with treatments, but we cannot refrain from bringing out certain general facts, as well as to mention some outstanding results obtained by us from certain forms of handling.

In the initial stages, before extravasation is extensive, we are firm believers in the application of a pressure bandage. This limits, very materially, the amount of extravasation as the result of the injury, and with proper rest may even abort serious sequelae.

The second point we bear in mind is the resort to antiphlogistic treatment at the first indication of inflammation. In our hands, no antiphlogistic treatment has given better results than a Priesnitz dressing or bandage. In our clinic we simply apply a layer of cotton to the affected parts, retained in position with a bandage and to the outside of this a layer of heavy paper, which in turn is held in position by another bandage. The cotton is then saturated at regular intervals with cold water. The heat of the animal's body warms the water, then more cold water is added, which in turn becomes heated, or, in other words, we have an alternate warm and cold application to the affected parts. If this is kept up, and the animal is rested, results are frequently surprisingly good.

During recent years, in the chronic stage of this condition we have resorted to blistering rather than line-firing. The blistering is carried out according to the method outlined in Frohner's *General Surgery*, and is as follows: "The hair is clipped, the skin thoroughly cleansed; then apply a red iodid of mercury ointment in the proportion of 1 to 4. This is rubbed in thoroughly for fifteen minutes, covered with an ordinary bandage over absorbent cotton, and allowed to remain in position for two weeks." During the first 24 hours this form of treatment makes the animal rather restless, attempts are made to bite the bandage, and this should be controlled, and during this period the bandage becomes saturated with an extensive exudate. This soon dries up and, at the end of two weeks, when the bandage is removed, the epidermis frequently comes along with it and a new growth of hair has started over the blistered region.

The action of this blister and the method in which it is applied is to cause a dilatation of the blood-vessels of the region, leucocytes pass out of the blood-stream, and the solid masses of exudate

are peptonized and absorbed as the result of the formation of ferments from the degenerating white blood corpuscles. In our hands this form of blistering has given most excellent results in handling of chronic tendinitis and we prefer it to line-firing.

Finally, if the affected tendon has contracted badly, so as to cause knuckling at the fetlock and elevation of the heel, tenotomy must be performed. In slight cases, with mild deformity and no extensive adhesions, the results are frequently very good, otherwise the results are seldom good.

SYNOVITIS

The particular form of synovitis that I wish to discuss here is that involving the sesamoid sheath. It probably is more characteristic to speak of it as a tendo-synovitis, or a tendo-vaginitis.

Occasionally the condition is spoken of as sesamoiditis. There are several forms of this condition, it being both a primary and secondary disease. As a primary condition it is most frequently due to traumatism, either of an external nature or as a result of violent use of the parts, such as may be observed in horses used at high rates of speed. It is sufficient to mention here that as a secondary disease it may be a sequel of various conditions and diseases, especially those of an infectious nature. In this discussion we are not particularly interested in that form of the disease occurring secondarily. It might be of interest to state that as a secondary condition more than one sheath is usually involved, while as a primary condition one sheath only is affected, as a rule.

The primary form may be either serous, sero-fibrinous, croupous, suppurative, chronic fibrinous, etc.

As a common condition in race horses the serous form and the chronic fibrinous form are commonest.

The acute serous tendo-vaginitis involving the sesamoid sheath is characterized by intense pain, as evidenced by lameness and flexion of the member, and of course almost complete disuse of the part. Furthermore, the diseased region is swollen and, on palpation, crepitation is frequently noticeable. In most cases, under appropriate treatment, an absorption of the pathological products may be brought about, but if this does not take place, a chronic fibrous tendo-vaginitis results, which is characterized by the formation of new connective tissue so that the tendon sheath is thickened and its walls become hardened.

In the early stages of this condition, cooling applications in the form of Priesnitz compresses, together with frequent massage applied once or twice daily, and absolute rest, will overcome the condition. After resorption of the pathological products has taken place, it is well to support the previously affected region for some time with a bandage, and to limit violent exertion until the part has again returned to normal.

In the chronic fibrous tendo-vaginitis of this region we have had excellent results from a counter-irritation according to the Vienna method, as outlined in the discussion about tendinitis.

In the very severe chronic forms, and because the tendon of the deep flexor passes through the sheath, adhesions are contracted between the tendon and the sheath, the tendon itself becomes inflamed and contracted, and as a sequence the heel is elevated from the ground and the fetlock pushed forward. In cases of this nature, one may attempt to restore the normal position of the foot by resorting to tenotomy of the deep flexor and, furthermore, the foot must be restored to a normal position by breaking down the adhesions in the tendon and its sheath. If these adhesions are not broken down, the tenotomy in itself is in almost all cases valueless.

II. Diseases of Hard Tissues

SPAVIN

The term "spavin" is a collective clinical term referring to a diseased condition of the hock joint of an extremely varied nature. Different investigators have at various times attempted to demonstrate a constant origin of the disease. It is now generally conceded that the disease may commence in any one of the different tissues of the hock joint.

Probably the commonest beginning of the disease is as a rarefying osteitis involving the fused first and second tarsal bones, the third tarsal, and the metatarsal. From its primary seat it may gradually extend to the articular surfaces, to the periphery, or in both directions. In the first instance it produces the condition clinically spoken of as occult spavin, or, it is a spavin without a visible spavin enlargement. In the second instance there is a more or less distinctly visible spavin enlargement on clinical examination. The rarefying osteitis is followed by a condensing osteitis, and this in turn by ankylosis, so that the diseased bones become fused into one mass.

Other investigators have determined that occasionally spavin may originate in the articular surfaces and at other times in the ligamentous apparatus.

The above-mentioned conditions may be due to either external or internal causes. It has been rightfully contended that spavin, or a predisposition to it, is transmissible from parent to offspring. To a very large extent this is due to the fact that a sire or dam



FIG. 1. Generalized anthritis, with practically complete ankylosis of all the bones of the hock joint.

may transmit to its offspring an intimate structure of bones and ligaments which predisposes to the disease. It is equally true that certain conformations, especially small cramped joints, are transmitted from parents to offspring and, under the influence of powerful muscular contractions, joints of this nature are more

susceptible to become diseased than when the joint is large and voluminous. External causes, such as repeated violent exercise, sudden wheeling around, throwing the animal on its haunches, working on very soft ground or rough roads, are all to be considered as unquestioned factors in the production of the disease.

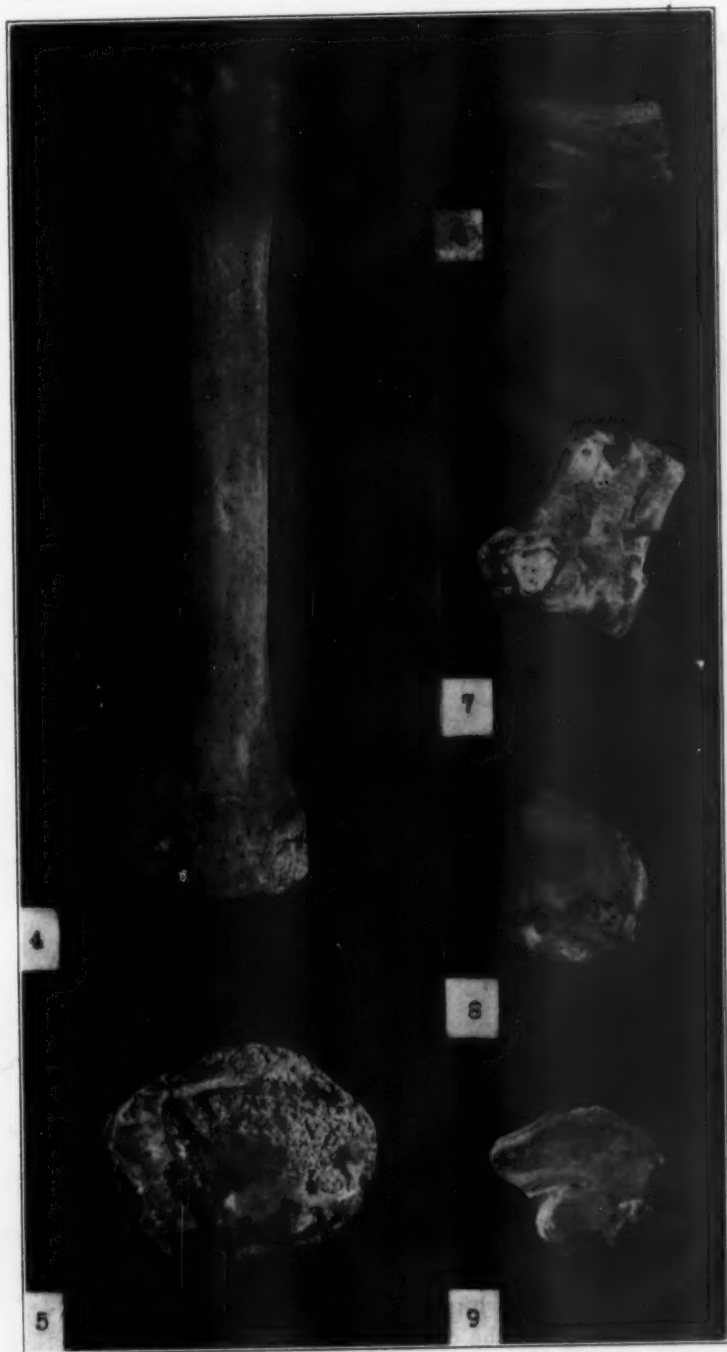
From the standpoint of symptoms, it is not entirely correct to say that spavin lameness has certain well-recognized character-



FIG. 2. A typical spavin, with ankylosis of the fused first and second tarsals, the third tarsal, the central tarsal and the metatarsals.

FIG. 3. A profile of the preceding.

istics. A careful examination of many patients so affected indicates that not only the lameness, but the conformation of the joint, the exaggerated hip-action, the presence or absence of a visible exostosis, and the duration of the disease, must be taken



into consideration in arriving at a satisfactory conclusion. If the lameness as the result of spavin is not of a mechanical nature, it will frequently be of the intermittent variety, or horsemen affirm that the animal warms out of it. Combined with this is the usually very noticeable halt in the movement of the affected limb when the animal is turned towards the sound side.

We believe that there is considerable virtue in the application of the spavin test, which consists in strongly flexing the hock joint by grasping the hind limb just above the fetlock joint. It



FIG. 10. A very large spavin in a typical location.

FIG. 11. Same as the preceding. Showing the involvement of the articular surfaces of the first, second and third tarsals.

should not be grasped in the region of the toe, because a clinician would in this event fail to exclude possible involvement of the phalangeal region. After excluding the influence of age, rheumatic effects, and possible traumatism, if the animal reacts to the test it is reasonably safe to make a diagnosis of spavin, whether the exostosis is present or not. Acute inflammatory changes are very seldom met with in bone spavin.

The prognosis of the condition depends upon several factors. We cannot hope to expect relief from mechanical lameness. Whenever a visible exostosis is situated far forward on the tarsal

FIG. 4. This is a comparatively small spavin. Some horsemen would call this a "rough hock." It is a good example of an occult spavin, as figure 5 indicates the extensive involvement of the articular surfaces.

FIG. 5. End view of the preceding. The dark spot in the center is an inflamed area.

FIG. 6. Fused third and central tarsals. An occult spavin.

FIG. 7. A view of the same from behind.

FIG. 8. Ventral surface of the fused first, second, third and central tarsals. An occult spavin.

FIG. 9. Diseased dorsal surface of the central tarsal. No external manifestation.

region, the prognosis, because of the danger of mechanical lameness, is not so good. The prognosis is less favorable as the size of the exostosis increases. The prognosis becomes increasingly less favorable as the animal advances beyond eight years of age. This statement is based on the fact that healing of spavin lameness depends almost entirely upon the production of an ankylosis between the involved structures. It is more difficult to obtain an ankylosis in mature animals.

There are a variety of forms of treatment to relieve spavin lameness. Each has its own peculiar indications. The operations from which the surgeon may make his selection are as follows:

Peter's cunean tenotomy.

Dieckerhoff's cunean tenotomy.

The actual cautery.

Tibio-peroneal neurectomy.

Peter's operation is particularly indicated for the relief of spavin lameness when there is no visible exostosis, or when the exostosis is very small. The exostosis must be so small that a knife rocked over it will reach and sever the cunean tendon. If possible this operation should be given the preference because of the virtually indelible scar left as a sequence of it.

Dieckerhoff's operation is indicated when the exostosis is so large that it has a groove in which is embedded the cunean tendon. The latter structure is so deeply embedded that it cannot be reached by Peter's method, though the more extensive Dieckerhoff operation will lift it from its bed so that it may be severed.

The actual cautery in the form of deep point-firing is indicated in all those cases where the exostosis is so large that the cunean tendon can be reached by neither Peter's nor Dieckerhoff's methods. In other words, the exostosis has grown completely over the cunean tendon. The actual cautery is also indicated when there is no relief from the lameness as a result of a previously performed Peter's or Dieckerhoff's operation. If at all possible, the actual cautery is not to be resorted to as a primary operation, because it leaves a more indelible trace of its performance than Peter's or Dieckerhoff's methods.

There is one thing in common for all of the three operations mentioned, and that is that they must be followed by ankylosis of the involved structures in order to obtain relief from the lameness. It is therefore valueless to perform any of the three operations unless the animal is maintained in a standing position in a



- FIG. 12. A good example of a peripheral spavin—fusion of the metatarsals with the first, second, third and fourth tarsals. The upper articular surfaces are not affected.
- FIG. 13. A medially localized spavin. The exostosis, to a slight extent, has fused the neighboring bones, but taken as a whole, the articular surfaces are free from the diseased process.
- FIG. 14. A spavin with incomplete fusion of the neighboring bones.
- FIG. 15. Another example of a spavin that might be called a "rough hock" by the inexperienced. Fusion is complete, the articular surfaces are clean and the animal was not lame.
- FIG. 16. The exostosis is virtually on the anterior surface. The articular surfaces are normal—with the tibial and fibular tarsals—but danger of mechanical lameness is great.

single stall, during the fly-free season, for a period varying from six to eight weeks, depending upon the age of the animal.

As a last resort and for the relief of a painful spavin lameness the animal may be subjected to a tibio-peroneal neurectomy, which of course does not cure the disease and which may be followed by any or all of the degenerative changes more or less common as a result of this operation.

RINGBONE

In the same way that the term "spavin" is a collective one, so also is the term "ringbone," a blanket diagnosis for various chronic inflammatory processes of an aseptic nature occurring in the vicinity of the corono-pedal and as high up as the metacarpal-suffraginal articulation.

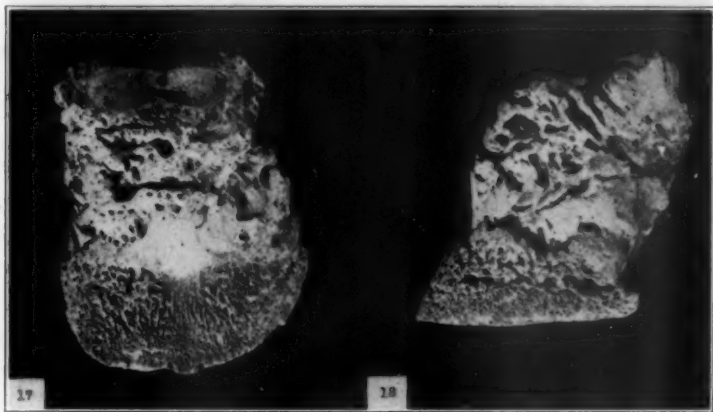


FIG. 17. An extensive articular ringbone that has also become periarticular (front view).
FIG. 18. Same (profile view).

There are at least two clear-cut varieties of ringbones, namely, the articular and periarticular. From the standpoint of origin of the disease and changes in the bone, the articular form is very similar to bone spavin, usually starting as a rarefying osteitis, which extends to the articular cartilage, resulting in degenerative changes. Almost simultaneously the reparative process commences in the osseous tissue as a condensing osteitis. The disease shows a decided tendency to spread in a centrifugal direction from these primary centers, so that there soon is the formation of osteophytes in the vicinity of the joint. These latter are usually due to an ossifying periostitis.

The periarticular form of ringbone, on the other hand, does

not usually involve the articular surfaces. It consists of an ossifying periostitis which originates almost always at the attachment of the lateral ligaments. Clinically a clear-cut case of periarticular ringbone is characterized by greatest prominence of the exostosis at the points of attachment of the lateral ligaments.

Occasionally an attempt is made to add additional classifications. It is not uncommon to hear of traumatic ringbone, which is essentially a periarthrititis as the result of a traumatism. Furthermore, rachitic ringbone is that variety observed during the course of rachitis. For all practical purposes, the terms "articular" and "periarticular" are entirely satisfactory.

The prognosis of ringbone from the standpoint of relieving any existing lameness is always unfavorable, and more unfavorable in the articular than the periarticular form. The reasons for making this latter statement are that in the articular form the joint is involved and, with or without ankylosis, is bound to be a cause either of pain or mechanical interference with proper movements of the joint. If the periarticular form is limited largely to the terminal attachments of the lateral ligaments, the prognosis is quite favorable. However, as soon as the process extends to the anterior surface of the joint, it is almost certain to result in mechanical lameness.

The handling of ringbone is also in a more or less unsatisfactory state. Deep point-firing has been practiced for years, but in our opinion is largely an empirical operation, performed because owners of animals demand it. It undoubtedly will change a chronic process into an acute one, and this is necessary in conditions of such a nature before healing can take place, but healing can do nothing for the relief of ringbone lameness. Either pain or ankylosis will perpetuate the irregular gait. An animal affected with these conditions may sometimes be materially relieved by appropriate shoeing, but when the animal is used on soft ground the influence of the shoeing is very largely lost. The only resort remaining to make the animal useful for an indefinite period, and this only in the absence of mechanical lameness, is unnerving.

The question arises frequently whether animals affected with this condition should be used for breeding purposes. There is unquestionably a decided tendency for the hereditary transmission of ailments of this nature. Breeders, on the other hand, will tell you that very frequently the offspring of spavined or ringboned horses will go for several years before they develop

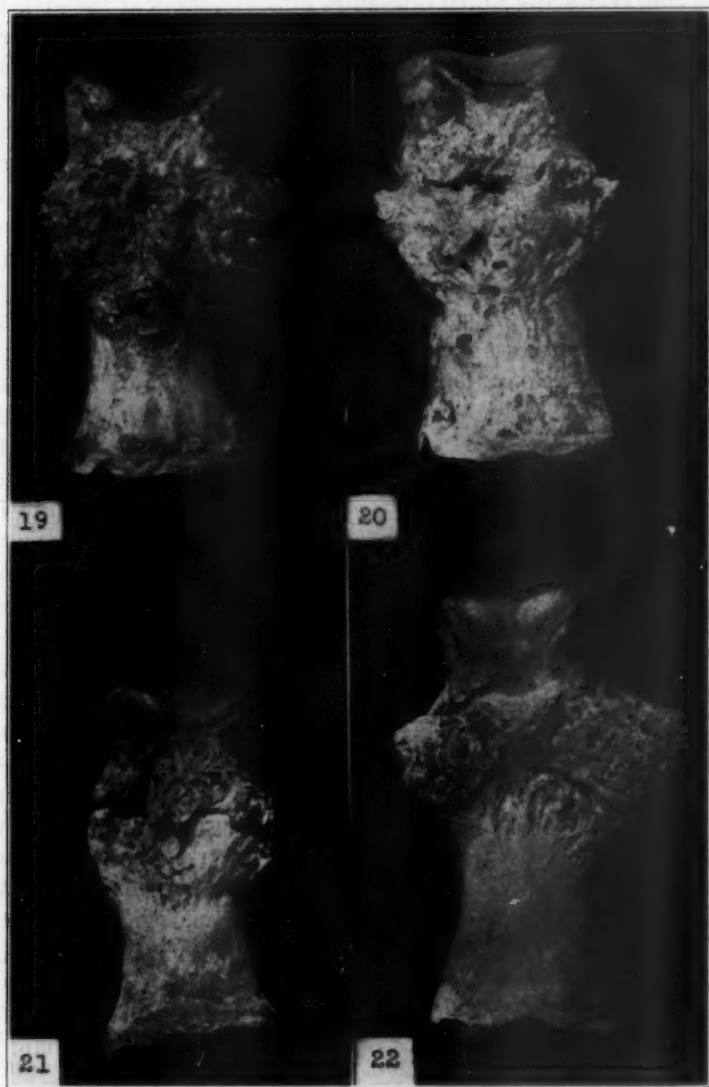


FIG. 19. Complete ankylosis of the first and second phalanges as a result of articular ringbone.

FIG. 20. Complete ankylosis as the result of articular ringbone. Patients thus affected are incurably mechanically lame.

FIG. 21. An articular ringbone, with fusion of the first and second phalanges.

FIG. 22. A typical periarticular ringbone. The articular surfaces are normal. Note the greatest enlargement at the points of insertion of the lateral and medial ligaments.

the paternal or maternal weakness, and that if they dispose of these animals before the weakness develops, they will be just that much ahead financially. Furthermore, no one can state positively that simply because the sire or dam is affected with a ringbone or spavin, that therefore it will invariably develop in the offspring. Prospective purchasers would nevertheless do well to look into the conformation and hereditary unsoundnesses that may possibly affect the foundation stock.



FIG. 24. Chronic gonitis in a colt.

NAVICULAR DISEASE

This is a rather common ailment in certain types of horses, especially Thoroughbreds. The disease is essentially an aseptic chronic inflammatory process affecting the navicular bone, the navicular bursa, and the perforans tendon of that vicinity. It is not yet exactly clear what is the origin of the disease. Probably it may originate in any of the three structures mentioned

above, though most commonly originating in the fibro-cartilage covering the posterior surface of the navicular bone. In support of this view the following pathological changes have been described: First, very small spots, somewhat colored, appear in the fibro-cartilage, and especially on its most prominent portion. This is followed by a proliferation of cartilage cells, erosions appear, the substance of the bone becomes affected with a rarefying osteitis, and may be so weakened as to fracture easily. Neighboring ligaments frequently undergo ossification.

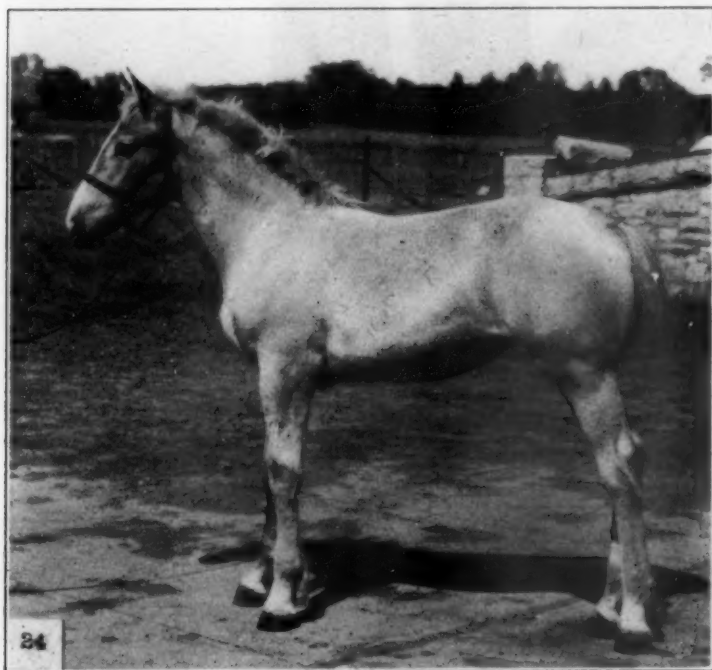


FIG. 23. A traumatic ringbone.

Cases are recorded where the walls of the navicular bursa apparently were primarily thickened and roughened, and the navicular bone and perforans tendon secondarily. In still other cases it appears that the perforans was the first to be involved, a rupture of some of its fibers occurring, and the disease then spread to the navicular bone. In these cases adhesions between the perforans and the gliding surface of the navicular bone have been observed.

In a general way the causes of this condition are believed to

be similar to those responsible for spavin and ringbone. There is unquestionably a hereditary predisposition to the disease, probably because of peculiarities in the structure of the involved tissues. External causes, in a general way, are held to be responsible whenever there is an increased strain in the navicular region. Such increased strain would be produced by contracted feet, by excessively sloping phalanges, by an unusually long toe or correspondingly low heel, and by the knee-sprung condition.

Clinically the disease is characterized by a slowly developing lameness, and in the early stages this may be noticeable only during the first few steps, disappearing with exercise. The lameness is of course most severe whenever weight is placed upon the affected foot. As the disease advances, the animal's gait becomes insecure, and it shows a decided tendency to stumble. It has been repeatedly observed that the symptoms have been most marked after a short rest preceded by great exertion. A most striking symptom is the almost constant "pointing" with the affected member. It is not the desire to create the impression that pointing is observed only in this disease, though a symptom of longer duration in navicular disease than in any other. In the course of time, because the animal avoids use of the posterior portion of the foot, and as this inhibits the physiological actions in the foot, contraction of the heels usually sets in.

A diagnosis of navicular disease may be made in cases of chronic lameness affecting the fore feet, in which there is pointing, and in which such other diseases in which there is pointing, as corns, thrush, bruises, etc., have been excluded. If the diagnosis is still uncertain, an injection of a local anesthetic over the digital nerves should clear up all questions as to the nature of the disease.

Treatment of this condition is not very satisfactory. Such animals must usually be kept from hard roads. The lameness seems to improve materially if an animal can be turned into pasture with every opportunity to walk on damp bottom-land. Such improvement is only temporary, because when returned to hard roads the lameness promptly recurs. It is contended that considerable relief may be obtained from certain types of shoeing, notably those that decrease the strain in the navicular region and at the same time minimize concussion. In this disease, as in all other chronic lamenesses, a final resort may be had to digital neurectomy.

In this discussion of lamenesses caused by anatomical changes below the carpus and tarsus, an attempt has been made to pick out certain more or less characteristic conditions and to point out types and conformations that may be responsible for them. Treatment has been mentioned only incidentally, because it has no real place in a discussion of anatomical changes of lameness. In these conditions, as in so many others, a serious attempt at prevention should be made by maintaining or obtaining those conformations which most readily can withstand the strain thrown upon them under modern systems of domestication.

DISCUSSION

DR. HAMLET MOORE: In the case of your bowed tendon, have you found that in most cases there is a rupture of the synovial sheath?

DR. DYKSTRA: I do not know that I just exactly understand the question, Doctor. In the chronic form, of course, there are extensive adhesions between the sheath and the tendon and in that way there would be an involvement of the synovial structures.

DR. MOORE: When a horse in a race ruptures a tendon, it is very often said that the horse has broken down. It is not a ruptured tendon but a bowed tendon. Do you find there is a rupture of the sheath in that case?

DR. DYKSTRA: A partial rupture, probably. There is a break in the sheath of the tendon. Those tissues binding the fibers together are involved, as well as the fibers themselves, and then there is an extravasation into the tendon. Those sheaths that you have reference to are involved, as well as the tendon fibers, in many cases.

DR. MOORE: You said the treatment of that condition, in the acute stage, was simply an application of hot and cold water, that is, under the process that you laid out, and you do that until the acute conditions have subsided?

DR. DYKSTRA: Yes, sir.

DR. MOORE: And then you use a red iodid of mercury blister and leave it on for a period of two weeks?

DR. DYKSTRA: Not necessarily. If the antiphlogistic treatment has caused a subsidence of the condition and the animal is in fairly good condition, we do nothing more for it, but generally return it to work. It is only in that chronic condition in which the extravasation has organized that we resort to the blister.

DR. MOORE: It has been my experience in racing stock that after the inflammation does subside the bow is still there.

DR. DYKSTRA: That is frequently true.

DR. MOORE: And if you have to wait until it gets to the chronic condition, you have to wait a long time.

DR. DYKSTRA: If the bow is still there, it seems to me the thing to do would be to apply that blistering treatment as soon as you have reduced the acute inflammation.

DR. MOORE: Then you spoke of leaving a scar tissue. Do you not find that the iodid does leave a terrible scar that is objectionable to the Thoroughbred?

DR. DYKSTRA: Yes, it does. I do not know how to get away from that completely, but one can reduce it very materially. The application of a blistering agent, such as was outlined, will absorb a great deal of it but will never remove it completely; a tissue that has been so badly injured as that is bound to have some remains of the injury.

DR. MOORE: You referred to the firing of the ring-bone as being an empirical method. What other method is there that you can adopt that will restore the normal function of a thoroughly established ring-bone?

DR. DYKSTRA: I do not know of any other method. Shoeing is of benefit.

DR. MOORE: What is the objection to deep-seated firing in a thoroughly established ring-bone?

DR. DYKSTRA: There is no particular objection, excepting there is no real reason for performing it. Of course, there is the reason to try to get the animal over the lameness, but there is no real basis for it from that standpoint.

DR. MOORE: You spoke of the firing as reestablishing an acute condition. We expect that. You are setting up a counter-irritation. This is not a eulogy, but I have fired any number of good horses with a thoroughly established ring-bone and I have never fired any that they have not said the foot was going to drop off, but none have ever dropped off; I have taken a cautery and gone in there three-eighths of an inch deep, into the bone tissue, and then used red iodid of mercury blister and those horses have gone on and raced again and gone sound. Of course there are some of them that are mechanically lame, they are not painfully lame, but they have made recoveries so far as their racing services were required.

DR. DYKSTRA: We have resorted to the same treatment; we do it very frequently, and we have had particularly good results in the case of the peri-articular ring-bone, but in the case of the articular ring-bone I question whether good results follow. Then it still remains to be established whether the treatment is actually the cause of the improvement or whether the animal has improved in spite of the treatment, or whether it would have improved without it, because they do frequently get better, that is, get over the lameness without the treatment.

DR. MOORE: In the words of our late lamented Professor Smith, he used to say, "Gentlemen, it is wonderful to know what Nature will accomplish if you will just give it a little chance." Perhaps in that light the rest that is necessarily given after the firing and the blistering may have accomplished something in spite of the treatment, in your language. (Laughter)

DR. H. S. MURPHEY: I have treated a good many bones of the limbs, particularly the lower part of the limb. I am quite satisfied that in the interpretation of the ring-bone he has not hit the keynote in the type of cases I have seen. I have seen very few of the processes that looked like a lateral involvement. There are two pairs of posterior ligaments called the lateral and central. The process in most cases of ring-bone, particularly the periarticular, the kind the member from New Orleans speaks of, starts from a slight rupture of these two ligaments, frequently the central pair, which is weaker. There is no movement to amount to anything in this joint. The mechanism is one for stability and not mobility.

In the case of navicular disease, we have seen quite a bit of material that shows that navicular disease starts in the perforans, and from there develops into a bursitis, with tendinitis following as the last of the sequelae.

***Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16***

SOLID BONE

The mistress of the house was returning from a party when she was met by the maid.

"The baby was very cross when you were out and I gave him some of his medicine."

"My stars! What have you given the child? He had no medicine!" cried the frantic mother.

"Oh, yes, ma'am, here it is." And she held up a bottle labeled "Kid Reviver."—*Science and Invention*.

POULTRY HYGIENE

By ARTHUR VANCE, *Provo, Utah*

It is not the purpose of this paper to take up a detailed review of individual diseases, but rather a general survey of the poultry problems confronting you men relative to the scientific application of the principles of sanitation and hygiene, so necessary to the maintenance of a profitable poultry industry.

I have made use of material furnished by a number of specialists in poultry diseases, among them Beach, of California; Moore, of Cornell; Ward, Gallagher and others. The men with whom I have worked personally in the laboratories and whose opinions I value highly are Drs. Erikson and Breed, of Missouri; Drs. Van Es, Martin, Olney and Skidmore, of the University of Nebraska. Throughout my paper I have quoted these authorities freely.

The foundation upon which our poultry industry must be built is freedom from diseases. A diseased flock cannot be maintained on a paying basis, even though it may represent the best blood in our country. There are many ailments common to the poultry flocks of the United States.

There is no other form of animal life that suffers more from the ravages of disease than fowls. The losses from the general maladies are heavy and those from the infectious ones are sometimes appalling. Various estimates have been made of the annual losses occasioned by these causes. They vary from 10 to 90 per cent. Hens in particular suffer from a wide range of diseases and parasitisms. Some of these are veritable plagues and at times are the cause of serious losses. While it is easy to understand that heavy losses may occur in localities where fowls are kept in large numbers, it should be recognized that they are proportionately heavy in smaller flocks. In such circumstances, the death of a few hens is often the cause of much privation, if not actual suffering, among their owners who are dependent upon the products of their fowls for the necessities of life.

The general diseases of poultry present many points of interest, although they have received relatively little attention. The general pathology of the feathered tribes is not well understood. Little seems to be known of their tissue reactions to injury.

*Read before the first meeting of the Intermountain Livestock Sanitary Association, Ogden, Utah, January 6, 1927.

Their resistance to ordinary wound infections differs strikingly from that of mammals. Pasteur suggested that this might be due to their higher body temperature. On the other hand, the infectious diseases and parasitisms have been more carefully studied. The findings of many valuable researches are recorded on the nature of the more serious ones. Certain of them, such as bacillary white diarrhea and the parasitisms, have been elucidated sufficiently to enable veterinarians or poultry-owners to prevent them. Others that cause heavy losses, such as roup or diphtheria and tuberculosis, can be controlled. When this is done, millions of dollars worth of poultry that is now lost will be saved. This can be done as soon as the technical knowledge now available, is utilized to its full extent.

THE FLOCK THE UNIT

It is believed that veterinarians can render a valuable service to this heretofore professionally neglected, yet important, industry, especially in localities conspicuous for the raising of poultry. Because of the relatively small value of the individual, and the large numbers to be dealt with, methods for preventing disease must be applied to the flock. With the exception of the more valuable birds, individual treatment may not be practicable, but the principles of sanitation and the preventive measures are as helpful here as elsewhere in the raising of animals. Veterinarians should realize that the treatment, prevention or control of diseases in poultry is primarily an economic question and that money saved by preventing or treating diseases in fowls is just as essential as the saving of a like amount in other animals.

The frequency of live stock diseases is to a large extent dependent upon the density of the animal population. During the years immediately following the period of the pioneers, when farm flocks were yet small and far between, the diseases of domestic fowls did not constitute a problem worthy of great consideration. This has all been changed during the last two decades. Owing to the increased costs of food products and improved marketing facilities, the poultry industry has assumed proportions undreamt of a quarter of a century ago. Poultry-raising gained recognition as a valuable part of the business of farming, and farm flocks greatly increased, not only in numbers but also in size. As the poultry population became more and more dense, disease problems commenced to present themselves

at an increasing rate until at the present time they must be reckoned with constantly and seriously.

The successful pursuit of poultry husbandry, to a marked degree, is dependent on our ability to maintain a flock in such a manner that a certain type of disease is not readily contracted by the birds and that their spread is effectually prevented. When flocks are small and widely apart, protection against disease is not an urgent factor, but with the increase in poultry population the time sooner or later arrives when serious attention must be given to this detail of management.

DENSITY OF POPULATION A BIG FACTOR

Disease problems to a large extent come about as a corollary to increases in the number of animals maintained on a given area, and the mass diseases, unless restrained by artificial means, constitute one of Nature's means to make over-population impossible. The maintenance of large flocks thus is fundamentally a deviation of the scheme of Nature which cannot be persisted in for a great length of time unless methods be designed and followed which tend to remove the disease hazard peculiar to a dense population.

The remarkable development of our poultry industry with larger and more numerous flocks has by now reached a phase in which the disease problem is cruelly asserting itself. The time when this problem can be wholly ignored lies now well behind us and in the management of flocks a solution must be found so that the considerable assortment of prevalent diseases will not cut too deeply into the profits of our poultry-growers.

Even more than in the ills of any other type of live stock is the solution of the poultry-disease problem dependent on the intelligent application of the principles of hygiene and sanitation. It will therefore not be amiss to call attention to the most basic of those principles, so that flock-owners may be informed of the ways and means now recognized as essential to success in poultry production. The application of the principles set forth on the other hand must vary under different local conditions, but on the whole it is possible to solve the individual problems without deviating very far from a general plan of action.

The task of poultry hygiene is twofold, because it aims not only to promote health but also to protect and defend it. In

connection with the former, conditions are sought to be established under which the vital functions of the animal body can be performed with the least hindrance and at a maximum efficiency, while the latter is designed either to ward off actual causes of disease, to interrupt their free movements, to bring about their destruction, or, if possible, to do all these things in the same general attempt.

Among the factors conducive to health and to body efficiency mention must be made of (1) sound body, constitution, and vigor; (2) adequate nutrition; (3) suitable environment and (4) the eradication and control of the transmissible diseases.

BREEDING STOCK

From a standpoint of productivity and sanitary fitness, stock should have good conformation, be healthy, vigorous and robust. When increasing a flock, preference should be given to hatching eggs or day-old chicks from stock known to be free from disease, especially with reference to bacillary white diarrhea which is transmitted by means of infected eggs.

SUITABLE ENVIRONMENT

The surroundings in which birds have to live are of material influence in the maintenance of the health of a flock.

Poultry-yards and the sites for poultry-houses should be selected with a view to dryness and shelter.

The presence of surface water, which birds are apt to drink, must be regarded as a very serious source of mischief. For this reason pools and puddles, filled wagon-ruts or open drains should never be tolerated in yards used for poultry.

The value of good housing is above all apparent as a detail influencing production and body efficiency, but the sanitary construction and management are only helpful in coping with the external parasites and possibly with the respiratory diseases of the roup type.

It should always be kept in mind that the most devastating poultry diseases, such as tuberculosis, typhoid, cholera, black-head and coccidiosis are but rarely contracted in the houses.

SOIL

The soil of the poultry-yards presents a hygienic aspect of a tremendous importance because on it are deposited the body wastes of the fowls and those constitute, for the diseases men-

tioned, the most common, if not the usual, vehicle for their transmission.

The small areas of soil occupied by large numbers of fowls are apt to receive a greater supply of body wastes than the ground can dispose of and when once any of the types of infection mentioned have been introduced into a flock, the disease-producing germs or parasites are not promptly destroyed and the area affected is bound to become a more or less enduring hotbed of infection.

The soil tends to rid itself of all organic material and germs which do not strictly belong to it and this process is known as biologic purification, because the living matter of the soil is almost entirely responsible for this cleansing process. This process is, however, not continuous during the year; throughout the winter months it is practically at a standstill, while during the warm and moist weather of summer it is the most active.

SANITATION

In the sanitary management of poultry flocks the feeding habits of the birds must be reckoned with and this the more seriously as the number of the fowls becomes greater.

Were it possible so to surround our poultry flocks with safeguards and barriers that the introduction of disease-producing agents could be excluded, there would be but little necessity to take any other step in disease prevention. Under the prevailing conditions of flock management and especially because of the imperfect knowledge pertaining to the initial introduction of infection, this is as yet impossible and hence we are forced to adopt methods which tend to render disease transmission and spread impossible or difficult and in this effort we proceed by securing for the birds the safest possible environment and by the adoption of such methods of feeding and watering as tend to reduce the hazard of disease transmission to the smallest possible proportions. All such methods form part of what is generally included in the term "sanitation."

DRINKING WATER

As a means of disease transmission, the part played by the drinking water is probably even more important than any of the other factors mentioned. Water lends itself particularly to contamination and the danger associated with polluted water is further increased by the fact that in certain cases it may

constitute a favorable medium in which disease-producing microbes or larger parasites can become more readily disseminated.

Even when the water is provided in otherwise suitable vessels, the way for pollution is always open, because either filth is deposited into the watering utensils by means of the soiled beaks or feet or they are often so constructed that the body wastes can be directly dropped into the water.

Watering devices can be so made or placed that pollution is rendered impossible and then the only remaining danger is offered by surface water accumulations in depressions of the ground, in open drains, or similar places where water can gather.

No matter how efficiently or how cleanly a water supply is made available, its value can never be superior to that of the worst water to which the flock may have access. Only after all possibility of polluted water has been eliminated can one become certain that the use of sanitary drinking devices are really factors of value in disease prevention.

POULTRY-YARDS

In order to avoid the undesirable contact of the younger birds with the adult fowls, the former can be permitted the outlying portions of the farmstead, where, housed in movable brooder-houses, they can be moved from time to time to newer range until the age is reached when they can join the older birds in their enclosure, with a relative degree of safety.

A yard with a soil so pervious, or with a sand or gravel top-dressing so open, as to preclude the gathering of water even after heavy rains comes very, very near being an ideal one. The writer has a vision that in a not very distant future such yards, deliberately established, will come to be recognized as an essential feature of the permanent poultry-farm.

Next in importance after the removal of dangerous water accumulations is the provision of drinking water of unquestioned purity in containers so constructed as to reduce the chances of contamination with fecal matter to a minimum. The watering utensils should be so covered or otherwise arranged that the birds cannot deposit their droppings in the water.

With the type of equipment usually available an absolute protection is not readily accomplished, owing to the fact that birds with soiled beaks or those which suffer from any of the

roup-like diseases can always befoul the drinking water. Hence most, if not all, utensils of this sort cannot be designated as strictly sanitary even if the gross pollution common to the open trough or vessels is more or less effectually done away with in the manner indicated.

In order to reduce or eliminate the danger incidental to contamination, it is a common practice to render the water comparatively safe by the addition of certain antiseptics in amounts harmless to the birds.

A more efficient method of supplying a safe water to poultry can be proposed in the form of a self-cleaning cup on the plan of the sanitary "bubblers" now in common use in public buildings, parks, etc. It can be put into practice only where running water is constantly available, but even the ordinary windmill and tank equipment of many farms could be utilized to advantage in providing this more or less ideal means of watering poultry.

MANNER OF FEEDING

Not only must the water supply be adequately safeguarded against the introduction of fecal matter, but the same precaution must be taken in regard to the feed offered to the flock.

It is commonly stated that in order that birds may have the amount of body exercise which is more or less essential to health, they must be made to scratch for their feed and hence the grain fed is often thrown on the ground.

The possible good derived from scratching for a living must, of course, be granted, but the fact remains that for reasons already stated the dung-laden soil is scarcely a particularly safe dish to eat from, when the subject is viewed from a hygienic standpoint.

For this reason the benefit derived from exercise may be largely cancelled by the disease hazard which is bound to accompany the feeding from the always polluted ground of the poultry-yard.

Our poultry industry and the type of diseases by which it is menaced have by now reached a stage which demands attention to this detail of the business in a most imperative manner.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia September 13-14-15-16***

TUBERCULOSIS ERADICATION IN CATTLE, SWINE AND POULTRY IN HILLSDALE COUNTY, MICHIGAN*

By T. S. RICH, B. A. I. Inspector-in-Charge,

Lansing, Michigan

I fully appreciate the honor conferred upon me in extending an invitation to appear before your association, to present a paper covering briefly our work in connection with the eradication of tuberculosis in cattle, swine and poultry in Hillsdale County, Michigan.

Hillsdale County has become widely known because of the fact that it was the first county in the United States to receive the benefit of a drive; that is, a united effort upon the part of several veterinarians to apply the tuberculin test to all of the cattle in the county within a short space of time. However, it is my belief that the fine spirit of cooperation given us, not only by the county officials, but by the people in the county, in connection with this project, has aided materially in extending the popularity of this work to the rest of the country.

As your secretary suggested, in his invitation, that I go over quite fully the work which has been done in Hillsdale County, it will be necessary that I cover the subject more broadly than the title of my paper would indicate, and, in doing so, when I speak of the method or plan carried out in Michigan, I do so with the full knowledge that owing to the difference in laws and conditions in various states, our plan probably would not be workable to the same degree elsewhere that it is with us. Nevertheless, as we are all striving toward the same goal, it matters little which route we take, so long as the desired result is attained.

In our cooperation between the state and federal governments in Michigan, we have interpreted the federal law quite literally where it states that the federal appropriations are to be used in cooperating with states, counties or municipalities. Therefore, we have never entered into cooperative plans with any other organizations. In keeping with this policy, the Hillsdale County Board of Supervisors extended an invitation to us to appear before them while in regular session in March, 1921, for the purpose of explaining our plan of federal, state and county cooperative bovine tuberculosis eradication. This plan having

*Presented before the annual meeting of the Iowa Veterinary Association, Des Moines, Jan. 19, 1927.

been accepted and the necessary appropriations made by the county officials, actual work was inaugurated, May 15, 1921.

The tuberculin testing of the herds proceeded so favorably that, following a visit to our state in August, 1921, Dr. J. A. Kiernan, chief of the Tuberculosis Eradication Division, proposed that the drive previously spoken of be undertaken. This drive was carried out in October, 1921, using 33 state and federal veterinarians and covering the entire county in twelve days. The test was applied to 26,911 cattle, revealing 618 reactors upon 227 farms, or 2.3 per cent. Following this drive, all infected herds were retested within six months and a second drive put on in October, 1922, by state and federal inspectors, which covered all of the herds in the county and which revealed infection to the extend of 69/100 of one per cent. It then became necessary to reduce the percentage of disease in the infected herds below one half of one per cent. Through retesting, this result was accomplished and the County was declared a Modified Accredited Area, July 23, 1923.

BOOTLEGGING ACTIVITIES

Although retesting was followed up in all herds where infection was known to exist, there was little retesting done in the supposedly clean herds during the three years following. As a result of this county accreditation, the sale value of dairy and breeding cattle advanced from ten to twenty-five dollars per head, with buyers traveling over the County, picking up nearly every animal offered for sale at the advanced prices. This brought forth quite extensive activities upon the part of unscrupulous dealers, in "bootlegging" cattle into the County from areas not under supervision, for the purpose of obtaining, through fraud, the advance in price and in violation of both state and federal regulations governing the movement of such cattle.

Not being able to determine fully how extensive these fraudulent operations were being carried on, and realizing the possible danger of reinfecting the herds of the County through this practice, persons having the eradication project in charge became quite uneasy concerning the retesting of the County, which was to take place before July 23, 1926.

As the county officials had been advised at the beginning of the work that when the County met the requirements of accreditation it would then become the duty of the County to continue such work as was necessary to keep the disease under control

and, also, that our services would continue only in a supervisory way, therefore, as a result of this early education the County Board of Superivsors was fully informed concerning the part which they were to take in the reaccreditation movement. With this in mind we were again invited to appear before the Board, at their January, 1926, session, to discuss the reaccreditation program.

The Board advised that they were ready to employ local accredited veterinarians and proceed with the retesting of all of the herds, if we would accept and arrange for the supervision of the work. This proposition was acceptable to all concerned. Accordingly, six local veterinarians were employed by the County at \$10 per day and nine cents per mile for the use of their automobiles. They were to work at least four days each week and were to inject an average of fifteen herds per day. The retesting was successfully carried out under this plan during the first five months of 1926 and, to out great satisfaction, the percentage of infection found to exist was only 95/100 of one per cent. If, during a three-year period, in a county where a possible source of reinfection was known to exist, the spread of infection was less than $\frac{1}{2}$ of one per cent, there surely can be no more positive proof that bovine tuberculosis can be controlled.

SEVERAL SURPRISES

There were several surprises in connection with this test for reaccreditation. The one of most interest to us was the fact that of the 186 farms where infection was found, 154 were farms upon which no infected cattle had ever been found, leaving but 32 farms upon which bovine tuberculosis was known to have previously existed. However, we do know that avian tuberculosis exists in a large percentage of the poultry flocks in this county, which fact may have some bearing upon the large number of newly infected farms and which also may possibly account, to some extent, for the large number of no-visible-lesion cases reported following the slaughter of the reacting cattle.

I am of the opinion that the investigational work which we have been conducting in Hillsdale County in connection with avian tuberculosis among the poultry and swine was more instrumental in bringing me the invitation to come here at this time than it was to hear a report covering our activities in the control of bovine infection. I draw this conclusion from the many letters of inquiry which we are receiving from different

parts of the United States concerning avian tuberculosis, which indicates that avian infection is widespread and that plans for its control are being considered in many states.

You will note, as we proceed further in this discussion, that in our study of the avian problem we have engaged in four different projects, all carried out in the same county and with at least three of them experimental to a large degree.

In September, 1923, the Chief of the Bureau advised that information was desired relative to the percentage of swine tuberculosis which existed in an area free from bovine infection, also the percentage of the same infection existing in an area where the bovine tuberculosis eradication project had not been inaugurated. As our communication from the Chief gave no instructions concerning the manner in which we were to proceed to obtain the desired information, we will freely admit that some little time was given to the study of the problem before the attempt was made. While the Bureau requested only the percentage of infection among swine, it was our judgment that while gathering that information we should also take advantage of this opportunity to obtain further information concerning the type of infection with which we were dealing.

IDENTIFICATION SYSTEM DEvised

In our choice of areas we quite naturally picked Hillsdale County as the area free from bovine infection and, after some consideration, Clinton County was decided upon as the area in which no bovine tuberculosis eradication work had been conducted. We found that practically all of the hogs from Hillsdale County were shipped to Buffalo for slaughter and that the bonus of ten cents per hundred pounds paid by the packers was being claimed for a large part of the shipments. Therefore, our problem of obtaining the percentage of this infection in Hillsdale County was simplified. However, we were not so fortunate in connection with the shipments from Clinton County. Therefore, a system of identification of the carcasses after slaughter had to be worked out. We had heard something about a system of tattooing. This we tried, only to find that the modern hog-cleaning machinery would remove every trace of the marking if from 24 to 36 hours elapsed between the time of tattooing and slaughtering. After trying many different forms of colored preparations, we stumbled upon the fact that black auto-varnish, used upon the tattooing instrument, would leave a legible mark-

ing which would remain for a long period of time. We were then ready; not only to obtain the percentage of infection but also to trace the infection back to the farm from which the hogs were shipped.

Through the cooperation of Dr. B. P. Wende, B. A. I. inspector-in-charge of meat inspection, at Buffalo, we received reports covering the slaughter of 13,264 hogs shipped from Hillsdale County, 2,219 of which were found to be tuberculous, or 16.8 per cent. However, only one carcass was condemned and five carcasses passed for sterilization. As these hogs came from all parts of the County, we believed the percentage of 16.8 to be a fair estimate of the extent of the disease at that time. However, it was found later that the percentage was increasing, until it reached 19.5 per cent, where it has remained quite stationary. You will probably be interested in learning that our study of conditions in Clinton County revealed that 23.5 per cent of swine infection existed, which, you will note, favored the area free from bovine infection by about 7 per cent.

In doing this work we were able to trace the infection, through the aid of tattooing, back to 39 farms in Hillsdale County. An examination of the tuberculin test reports covering the tests applied to the cattle upon these 39 farms showed that upon 22 farms no infection had ever been found among the cattle. Upon 15 farms bovine infection was found in 1921, but with no infection upon subsequent tests. There were two farms upon which no cattle were kept.

SWINE AND CHICKENS TESTED FOR TUBERCULOSIS

In order to obtain further information relative to this swine infection, we applied a double tuberculin test to the swine upon 13 of those farms, using B. A. I. intradermic tuberculin in the right ear and avian tuberculin in the left. We tested 214 hogs, revealing 37 reactors as follows: 1 reacted to standard tuberculin only, 5 reacted to both standard and avian and 31 reacted to avian only, a percentage of 17+, which checked quite closely with the 16.8 per cent reported through postmortem at Buffalo. At the same time a tuberculin test was applied to 15 lots of chickens taken from the above-mentioned 39 farms, 38+ per cent reacting, located upon 12 farms. You will note from this report that we were dealing with an extensive avian infection upon the farms under investigation, while we were not able to find reactors among the cattle upon these same farms. The

result of this work, followed by laboratory reports covering the inoculation of chickens and guinea pigs with material taken from reacting swine, proved quite conclusively that it was largely avian infection with which we were dealing.

This information brought, not only to our attention but to the attention of the Hillsdale County Board of Supervisors as well, the extensive hold which avian tuberculosis was getting upon the flocks of that county. Alarmed by this knowledge, the Board urged further investigational work which brought about the second project in which we have engaged.

Because it appeared to be the general belief of investigators of poultry diseases that a chicken under one year of age would seldom develop this disease to the extent of becoming a spreader, and believing that the culling from the flock of all birds above that age would eliminate the infection, we entered into an arrangement with the Board of Supervisors to put on, in a cooperative way, a culling campaign covering all of the flocks in Adams Township, for the purpose of proving or disproving the efficacy of the above-mentioned theory. An expert from the Poultry Department of the Michigan State College was to assist in the culling. This work was started about December 1, 1924, and afforded us an opportunity not only to study farm conditions but actually to examine each individual chicken located upon 151 farms. There were 15,377 birds examined, and 1,494 removed as culls. Of these, 85 were found to be tuberculous at post-mortem. Three generalized cases were birds under eight months of age. Tuberculosis was positively found to exist in 38 per cent of the flocks examined.

CULLING ALONE NOT DEPENDABLE

The information gained from this work was sufficient to convince us that fowls under one year of age occasionally were found to be extensively tuberculous and, furthermore, that culling alone could not be depended upon to control this disease.

We were thus led up to the third project in our attempt to work out a plan which would bring us into closer relationship with a few flock-owners and at the same time would enable us to obtain more definite information concerning a practical method of handling individual flocks, both those which were infected as well as those free from disease. After much thought and many conferences with persons interested in the poultry industry, we decided upon what we termed the "tuberculosis-

free-farm plan," using an agreement similar to the accredited-herd agreement which included cattle, hogs and poultry.

This project was started in Hillsdale County, April 21, 1926. Only 25 farms were accepted for this investigational work, all located in different parts of the county and furthermore no tuberculosis infection was known to exist upon those farms.

Upon physical examination, there were three farms on which avian infection was found. Therefore, no tuberculin test was applied to the fowls. Upon the 22 farms where the tuberculin test was used, there were 2,676 chickens tested, revealing 84 reactors, located upon 13 farms. Of the 25 farms under observation, infection was found upon three, or 12 per cent, from physical examination and upon 13 farms, or 52 per cent, by the use of tuberculin. As all reacting chickens were slaughtered, it is interesting to note that but one failed to show visible lesions at postmortem.

In making this survey, a double tuberculin test was applied to the swine upon 22 farms. There were three farms upon which no hogs were kept. There were 301 hogs tested, revealing 18 reactors located upon nine farms. Of these reactors, ten reacted to both standard and avian tuberculins, one to standard only, and seven to avian only. In other words, there were 17 of the 18 reactors which showed evidence of avian infection.

Of the 25 farms under observation, there were eight upon which no evidence of tuberculosis infection of any type was found. Therefore, these met the requirements of a tuberculosis-free farm, while infection was disclosed among either the poultry, swine, or both, upon 16, or 68 per cent, of the farms. Of these infected farms, there were eight with infected poultry only, four with infected swine only, and five where there was infection among both swine and poultry.

TUBERCULOSIS-FREE-FARM PLAN PRACTICAL

This experimental work, although upon but a small number of farms, has demonstrated that the tuberculosis-free-farm plan is practical and that the use of this plan should be extended in all modified accredited areas, especially upon those farms where egg-production for hatching purposes is carried on, and where cattle have already met the requirements of accreditation.

Following this work, the Hillsdale County Board of Supervisors again urged that we broaden our field and cover at least one township. Their request was granted and the work is now under

way in Camden Township. However, owing to the extreme cold weather, the work at present is practically at a standstill. To date we have covered 83 farms, taken as they come, applying the test to 10,811 fowls, of which 3,259 were mature fowls and 7,552 spring birds. We have found 162 reactors, 1.51 per cent, on 43 farms. Of these reactors, 158 (4.5 per cent) were mature fowls and 4 (0.053 per cent) were spring birds. In the 43 infected flocks, infection was found by physical examination in 10, or 23—per cent, while the use of tuberculin revealed 33, or 76—per cent, infected flocks. In other words, there would have been 33 flocks passed as free from infection if only a physical examination had been used.

Among the 83 farms there were 42 farms on which no breeding hogs were kept. On the 41 farms having breeding swine, there were 132 breeding hogs tested, revealing eight reactors (6.8 per cent), located upon five farms, or 12.66 per cent farm infection.

It is to be noted that of the eight reacting hogs, four reacted to the avian tuberculin only, two to both avian and standard, and two to the standard only.

SUMMARY

There were 83 farms under test. Of these, 38 farms, or 45+ per cent, were found free from all infection. There were 40 farms with infected poultry only, three farms with both swine and poultry infection, and two farms with infected swine only, or a total of 45 infected farms, or approximately 54 per cent of the farms infected.

From the investigational work which we have carried on in Michigan, in connection with tuberculosis in swine and poultry, we have made the following deductions: Avian tuberculosis in the individual fowl is very similar to the same disease in the cow and can seldom be diagnosed by physical examination in the well-managed flock. Many fowls in prime condition are found extensively tuberculous. Tuberculin in the hands of an experienced operator is extremely accurate, either upon swine or poultry. However, owing to the conditions which usually surround its use upon poultry, the same accuracy cannot be attained as in its use upon cattle. All flocks in which infection is found, regardless of its extent, should be condemned and disposed of within a reasonable length of time, with the exception, perhaps, of certain purebred flocks.

It is also our judgment, because of the expense and the difficult conditions surrounding its use, that to attempt the eradication of this disease in poultry through repeated tuberculin tests will be little short of failure. The tuberculin testing of swine is practical and in our judgment the double test upon breeding stock should be used upon all farms where either avian or bovine infection is known to exist.

In conclusion we cannot refrain from again calling your attention to the fact that avian tuberculosis is with us and is increasing at an alarming rate. It must be controlled or the poultry industry in a large part of our country is doomed. Therefore, it behooves us to take advantage of every opportunity to gain further knowledge concerning this malady in order that its control, as well as the eventual eradication of all types of tuberculosis infection from live stock may be accomplished.

***Attend the meeting in Philadelphia,
September 13-14-15-16,
Where many things began and the best continue***



William Penn's House, Fairmount Park, Philadelphia.

CONVULSIONS IN DOGS*

By CAPTAIN WILL C. GRIFFIN, *Fort Sam Houston, Texas*

Veterinary Corps, U. S. Army

It is not my intention to enter upon a lengthy scientific discussion of convulsions in dogs. First of all, today, I am among canine specialists and veterinarians who have had an extensive small animal practice and many have had a vast experience with convulsions in dogs. As an Army veterinarian, naturally you are all aware of the fact that we do not have an extensive small animal practice. I am referring to the subject of this condition more from the standpoint of a breeder than that of a practitioner and therefore my experience will differ accordingly from that of the practitioner.

During the past six years, I have maintained a large kennel of German Shepherds, commonly known as German Police dogs. My kennel was conducted on a large scale and I maintained the kennel proper at a short distance from my residence. A good many brood matrons were placed out on shares, or, as we say, "farmed out." In this manner the puppies were raised under varying conditions. The one great obstacle with which I had to contend was the frequency of convulsions which occurred among the dogs owned by me. My experience with this condition was a very interesting one, as well as a costly one. In many instances I had disposed of puppies for a handsome price and then had them returned to me within a few days suffering from convulsions. Many large kennels dread this condition. Many kennels boast of never having had the unfortunate condition in their animals, but a large majority have experienced a heavy percentage.

During the year 1922, considerable discussion appeared in the various veterinary journals, concerning the appearance of a new disease called "frights disease." This malady was characterized mainly by convulsions. As many different articles as were written on the subject contained as many different opinions as to its cause, symptoms, etc. Many practitioners doubted the existence of such a disease. There was considerable discussion as to its nature and many claimed it to be of an infectious nature. I have had the condition described to me by many

*Presented at the semi-annual meeting of the State Veterinary Medical Association of Texas, San Antonio, Texas, January 19-20, 1927.

experienced practitioners and many claim that as high as 80 per cent of dogs in a community are affected, dogs of all ages and breeds, mongrels as well as pure-bred, dogs that are free from intestinal parasites and intestinal disturbances, dogs that are fed on a strictly meat diet as well as those on a mixed or a whole-cereal diet, and animals that have had and fully recovered from distemper, as well as those that have never suffered from distemper.

FRIGHTS DISEASE NOT KNOWN IN GERMANY

From the description of this new disease that was given me by many practitioners, I realize I have not encountered "frights disease," but I do not wish to say that I do not believe such a disease exists. I do know from actual experience that this disease was unheard of in Germany during 1922, as I was in that country at that time, and recollect one animal that an Army officer shipped back to the States that became affected with "frights disease," according to a well-known practitioner, about two weeks after its arrival or just after its release from quarantine. I do not wish to refer to "frights disease" any further, because I evidently have not seen a case of this kind, and I do not believe the cases of convulsions I have experienced were those caused by one specific disease, because I proved to my own satisfaction the cause of the different types of convulsions appearing in my own kennels, in dogs owned by me or dogs disposed of by me to individual owners, who would return the dogs purchased, for treatment. I devoted a great deal of time studying the cases in my kennels and if I had not maintained a kennel I would not have had the opportunity of studying the conditions from the standpoint of a breeder.

There is no doubt that convulsions in dogs are more common in the United States now than they were ten or fifteen years ago. Dogs of the United States are changing. New breeds are being developed. There is too strong a practice in inbreeding among many breeders, in attempts to produce a variation in the breed or the type, attempts at improving individuals, producing toy types of various breeds, etc. All these factors enter into the consideration of common ailments, which may have a bearing on convulsions due to weakening of vital organs. Changing conformation of animals, by such inbreeding and crossbreeding, surely has as its sequel a retrogressive change in vital organs. Another factor entering into causes of various

diseases, which may in turn produce convulsions, is the feeding of an inferior or deficient product. How many firms were manufacturing dog foods fifteen years ago? Compare that number with the number of dog-food concerns today. The majority of these concerns are located in one large city of this country, a city known for the manufacture of various breakfast foods under different names.

Some of the firms which manufacture dog foods advertise some of the well-known breakfast foods as ingredients in their products. Take into consideration the cost of some of these dog foods. Some are so astonishingly low that you wonder what on earth can be in them. Foods are being put out at prices that are even below the cost of a poor-grade grain which is used in their making. Such ingredients can not be of a wholesome quality and are either sweepings from various breakfast-food concerns, sweepings of mills, or are mouldy, rejected ingredients. Many practitioners will relate cases of convulsions which were produced soon after placing animals on some of these commercial foods. I have experienced cases which I know positively were caused by such food. We can not condemn all firms manufacturing a mixed-cereal dog food, because some produce a very reliable food, prepared under strict supervision and of wholesome ingredients.

DOG BEING CHANGED

We are constantly changing the dog from a carnivorous to an omnivorous animal. His natural instincts cause him to seek foods containing the necessary vitamins contained in meat. He will, therefore, eat objects if placed on a cereal diet that he would not eat if upon a meat diet and in this way swallows many foreign objects and indigestible material. Many practitioners will state the mongrel rarely suffers from intestinal disorders or common ailments. The reason probably is the food, care and handling the mongrel receives.

Convulsions, we know, may result from numerous causes and are only symptoms of existing diseases. The common causes of convulsions in kennels and among a great many individual dogs are in all probability common disorders mentioned herein. Dogs of all ages are susceptible, but naturally puppies from three and one-half months to nine months of age suffer most and during their dentition period they continually chew and gnaw upon various objects. The presence of vectorial insects in kennels

also has a great bearing. Dogs over fifteen months old are not so susceptible as the younger dogs.

Generally speaking I would divide the common causes of convulsions most frequently met with into three classes: first, dietary deficiency; second, gastro-enteritis; and third, auto-intoxication. I believe that each form of convulsions resulting from these causes presents a quite clear clinical picture. The symptoms and prognosis depend upon the causative factor.

Dietary deficiency cases will generally have a history that the animals were fed on cornbread, cracklings, cornmeal, rice, commercial dog biscuit or other cereal food. Little or no meat has been fed and very seldom any bones to chew upon. The convulsions from this condition come on real suddenly and are more of a clonic nature. Prior to the convulsions, the animal has exhibited no signs of any disease or disturbance, other than a slight diarrhea. There is a sudden loud barking, which is very rapid and sharp, the animal starts running, runs into objects and shows great anxiety or fright. The eyes appear to be normal and it is only through his great excitement that he runs into objects. He runs under a box or into a corner of his kennel, continues his sharp barking for some time, assumes a crouching position, head down as if he were frightened, and rests either upon the hind legs or sternum.

CHANGE OF DIET INDICATED

The convulsion lasts from three to five minutes and suddenly disappears. The animal will shake himself, arise and be normal again. There is no noticeable muscular weakness following this and no evidence of pain. Temperature is normal and within half an hour after the attack the pulse is normal. In several instances where there are several puppies in the kennel, all having been upon the same food, most of them will be affected. When first affected, the pup starts into convulsions. This excitement causes others to become affected and in many cases the entire kennel will be affected following the first case. This form is rarely fatal and soon disappears upon change from a cereal to a whole-meat diet. Other than a good eliminative treatment, nothing else than change of diet is required. The cases may last from one to three days after change of diet, but if maintained upon a meat diet they soon recover.

Convulsions resulting from gastro-enteritis constitute another common form. The history of the cases, the habits and the feed-

ing of the animals are of importance here. Some owners will inform you that they have given some patent vermifuge, or other patent medicines which someone has recommended for conditioning their dogs. In other cases, the owners will state that their animals have been constipated or have been noticed to swallow foreign bodies, such as cinders, coal, pieces of leather, feathers, hoof trimmings, gravel, etc., and have noticed these foreign obstacles appear in the feces. The animals may have suffered from diarrhea or from constipation for some time prior to the appearance of the convulsions.

The dog seems to be in great pain, the barking is very sharp, more like the bark of an injured animal. The animal runs, shows great anxiety, and is often noticed to bite at his side while in a spell. The convulsion lasts from three to five minutes and the animal frequently will groan for some time following. When attempts at defecation are made, where there are foreign objects in the intestines, it often starts again. There is clamping of the jaws and salivation. The saliva, however, does not seem to be thick. There is no loss of consciousness. The intervals between attacks vary from one to twenty-four hours and many disappear and return again at the end of four or five days. The appetite is disturbed and the animal soon loses flesh.

CONVULSIONS DUE TO AUTO-INTOXICATION

The third and most severe form of convulsions includes those resulting from auto-intoxication, which may be due to several causes. Animals which are heavily infested with intestinal parasites, tapeworms, and ascarids, which in great numbers apparently produce a toxemia resulting from metabolic disintegration products of the parasites, dogs fed upon a mouldy or decomposed food and those which have had an attack of distemper or those which are in the first stages of distemper, frequently exhibit this form. In determining the cause, the fact that the animal has or has not had distemper is an important factor. The presence of segments of tapeworms or a microscopical examination of the feces for these and other parasites, will facilitate a diagnosis if the condition is caused by parasites.

Animals seem to be dull or sluggish two or three days before an attack. Some dogs are very restless and take an ordinary running spell without any further signs of disturbance until the convulsion proper comes on. This type is the most severe. The animal shows great anxiety. A great stiffness is noted in

the beginning, pupils are dilated, head extended and rigid, profuse salivation, saliva very thick, legs stiffened, severe clamping of jaws. The animal reels, does not make attempts at running except in the first two or three attacks, and the gait is very unsteady. After a severe spell the animal will fall over backward, breathing rapidly. When the animal is down it assumes a recumbent position. There is a rapid flexion and extension of the legs while in this position, an involuntary passing of urine and feces, the latter being very soft and watery. The animal soon passes into a coma; eyes are sunken. Soon there is a relaxation, the animal then arises, but is in a very weakened condition for some time after. These convulsions last from five to fifteen minutes. In the severe cases they become more frequent, as the disease progresses and severe cases do not last over four or five days. Animals frequently die during convulsions. The mortality seems high in these cases.

Cases of this kind cause one quite some grief. I have, in many instances, succeeded in clearing the intestinal tract of parasites and have succeeded in getting a vast quantity of tapeworms and the animal would show no sign of improvement.

In some cases I hesitated to give arecolin, owing to the weakened condition, but later found there was no use hesitating as time could not be lost and chances were, as we say, too slim to waste time. I had quite some success from the administration of calcidin (Abbott) in these cases, giving a five-grain tablet per ten pounds of live weight, three times daily, for four or five days. This was given following the administration of the one arecolin treatment.

I do not wish to quote lengthy case reports at this meeting, but if any member here desires to see some of these, I have them prepared and same will be available at any time for examination.

***Thee and thine to the City of Penn;
Forget not when—September 13-14-15-16***

State Veterinarian Killham placed Oakland County (Michigan) under quarantine, June 4, on account of the unusual prevalence of rabies in that county. All dogs must be confined unless vaccinated against rabies. No dogs can be removed from the county during the period of quarantine, unless vaccinated against rabies by a qualified veterinarian, within one year of the date of removal.

PATHOGENIC PROTOZOA OF DOMESTIC ANIMALS*

By R. R. KUDO, Urbana, Ill.

Assistant Professor of Zoology, University of Illinois

This subject is a very broad one and to consider it briefly does not do justice to its importance to veterinary science. In contrast to what we know about Protozoa associated with man, our knowledge on forms living in domestic animals is much more limited. I shall present here our knowledge in a synoptic way, so that you will get a general view regarding these seemingly important animal parasites.

CATTLE

Pathogenic amoebae have not yet been found in cattle. Although there are several species of trypanosomes pathogenic in cattle in other parts of the world, especially in Africa, the only cattle trypanosome found in North America is *Trypanosoma americanum* (Crawley 1909), which was observed and described by Crawley. The flagellate is transmitted by flies belonging to *Tabanus*. It is not considered as a pathogenic form.

An acute dysentery, "red diarrhea," of cattle, due probably to a species of *Coccidia*, *Eimeria zurni* (Rivolta 1878), occurs in various parts of the world. It was first recognized as a distinct disease in Switzerland where, in certain years, the disease had assumed epizootic form. In 1918, Smith and Graybill studied the disease among young calves at Princeton, N. J. The calves became infected soon after birth and dysentery symptoms appeared in from three to six weeks. The disease ran a course of six to eight weeks. The parasite appeared to invade the epithelium of both small and large intestines. The oöcysts measure 13 to 30 μ in length and 12 to 20 μ in width. Davis and Reich (1924) found, in California, an apparently similar form. The once-dreaded disease of southern cattle, Texas fever, is due to an infection of the red cells by *Babesia bigemina* and is transmitted by a cattle tick, *Boophilus annulatus*, which does not extend to this state in its distribution.

SHEEP

Species of *Babesia* are known to infect and cause diseases in sheep in Africa and Europe, but so far none has been reported from the North American continent.

*Presented at the eighth University of Illinois Veterinary Conference, Urbana, Ill., Feb. 16, 1927.

Coccidial infection in sheep was first observed in the United States by Curtice (1892) and is now known to occur in various regions of Europe and Africa. All so-called species found in sheep may belong to one species *Eimeria faurei* (Moussu et Marotel 1901). The oöcysts measure 20 to 40 μ long by 17 to 26 μ broad, some being spherical with a diameter of 18 μ . Davis and Reich found similar oöcysts, but with micropylar cap. Stiles described the lesions due to infection as follows:

"On the mucosa of the small intestine there appeared irregular, slightly elevated, whitish patches, which on superficial observation gave the impression of a thin, spreading mycelium of some fungus. These patches were from $\frac{3}{4}$ to 1 inch in diameter. When examined fresh, the intestinal villi were very much enlarged. The epithelial cells lining these villi were very large and every one contained one or more coccidian cysts. The change in the mucosa was entirely due to the invasion of the epithelium by the coccidium. The symptom is dysenteric, but it is not clear whether this is the primary cause of dysentery or not.

Sarcosporidiosis is cosmopolitan in its occurrence. In the United States, sheep showed heavy infection in some of the Rocky Mountain States. The disease is due to an infection by a sporozoön, *Sarcocystis tenella*. The parasite attacks muscle fibers (voluntary, less frequently involuntary), forming lesions varying in size from microscopic to several centimeters in diameter. The attacked muscle fiber degenerates so that the parasite is left within the connective tissue of the host. The parasitic mass is surrounded by an envelope in which a radiation is observable. In experiment animals (mice) the incubation period is 35 to 50 days. Sheep have sometimes died with very heavy infection, and death was attributed to the sporozoön. Experiment animals die from heavy infection. Laveran and Mesnil (1899) showed that a watery or glycerin extract of the parasite, when injected subcutaneously (extract of 1 mg.), killed rabbits in five to ten hours. The method of transmission is not known. Rats and mice which eat flesh acquire the infection; but how sheep become infected is not understood. Spores were found in the blood-stream and the suggestion has been made that blood-sucking arthropods transmit the sporozoön.

HORSES

Endamoeba equi was found by Fantham (1921) in feces of South African horses. It contained red cells and Fantham held

that it was pathogenic for the horse. No further information is known. A number of pathogenic trypanosomes were reported from the horse in different regions of the world. Darling (1910) recognized a disease among the mules arriving in Panama from the United States, which resembled "surra," of Africa. In the blood of diseased horses, he found a trypanosome which he named *Trypanosoma hippicum*. Scattered among the South American countries is found a species of *Trypanosoma* in mules and donkeys suffering from mal de caderas. In the United States, there is a rather remarkable record to show how a single infected animal imported to a new territory can bring about enormous damage by spreading the disease. In 1886, Dr. W. L. Williams, then of Bloomington, Ill., found an outbreak of a disease in horses, which was later found to be dourine, caused by infection with *Trypanosoma equiperdum*. The disease was traced to a Percheron stallion imported from France, in 1882. It is most probable that the horse was affected by the trypanosome at the time of purchase. Instead of being destroyed, the stallion was shipped to Gordon, Nebr., in 1888, and, in 1892, an outbreak of the disease appeared in northwestern Nebraska. Upwards of 200 mares and stallions were found to be affected with the disease. There was another outbreak in South Dakota, in 1901. In 1903, government inspectors examined 16,287 horses, of which 511 were found infected and killed, while 1899 stallions were castrated. The last outbreak was in 1910, in Iowa, when a dozen horses were found infected with the disease.

Hogs

Hogs are very frequently infected by *Balantidium coli*, a parasitic ciliate, which is pathogenic to man. The infected hog does not show any lesions in the gut under ordinary conditions; according to Brumpt (1909), in one experiment pig, there was diarrhea associated with blood and mucus, and the ciliate in the fecal matter contained red cells. At autopsy, lesions were found in the large intestine. The protozoön is one of the largest parasitic forms, measuring 30 to 200 μ long by 20 to 120 μ broad. The encysted form is ordinarily 50-60 μ in length. McDonald (1922), in California, described a more slender form which he named *Balantidium suis*. It is said to be 35 to 120 μ long by 20 to 60 μ broad and its macronucleus is usually elongated.

Creech (1922) found cases of sarcosporidiosis among hogs.

DOGS

A number of cases of amoebic dysentery in the dog have been reported from Egypt, Panama, India and other parts of Asia, and in one case the dysentery was apparently associated with abscesses of the liver. The amoeba of dogs of Panama was named by Darling (1915) as *Entamoeba venaticum*.

Piroplasma canis is responsible for a malignant jaundice of dogs in various parts of Europe, Africa and Asia. In America, native record is yet to be reported. But Martinez (1914), in Porto Rico, and Clark (1918), in Panama, noticed the presence of the parasites in the blood of imported dogs. The organisms attack the red cells of host dogs; they are typically pyriform in shape and measure about $5\ \mu$ in length. A similar parasite was found in Brazilian dogs. It is a well-known fact that trypan-blue has remarkable powers in killing these parasites.

Coccidial infection is not uncommon in dogs; yet the nature of the effects on the part of the host animals is not at all clear. *Isospora bigemina* seems to be the common parasite of dogs everywhere, including the United States. Wenyon distinguishes three species of dog coccidia on the basis of differences in the seat of infection and size of oöcysts, which facts are receiving the consideration of protozoologists. The intestine is affected. The oöcysts found in feces vary in dimensions, and measure 10 to $48\ \mu$ long by 7.5 to $37\ \mu$ broad. Dogs are known to be naturally infected with human *Leishmania* in endemic areas.

CATS

As is well known, cats are easily infected with *Endamoeba histolytica*, dysentery amoeba, under experimental as well as natural conditions. *Eimeria* have been found in the feces of cats in Europe and Africa. There is little doubt that American cats, many of which are imported, harbor this parasite.

FOWLS

The coccidiosis of fowls, frequently called "coccidial white diarrhea," is due to a heavy infection of the host bird by *Eimeria avium*. This sporozoön is very widely distributed over the surface of the globe and is known to infect ducks, grouse, chickens, turkeys, sparrows, game birds and others. The seat of the infection is the alimentary canal, from esophagus to rectum, but most frequently the ceca and intestines. In them the parasite attacks not only the epithelial cells, but also sub-epithelial tissues.

When the bird is heavily infected by this parasite, the fecal matter is diarrheic and whitish in color; which apparently is due to the presence of a large number of oöcysts. The oöcyst is covered by a thick wall and specimens vary in dimensions, even in one kind of bird. In chickens they vary from 14 to 28 μ long by 12 to 23 μ broad, while in turkeys they are 10 to 38 μ long by 9 to 29 μ wide. While healthy birds often harbor this parasite without showing any symptoms, it seems to be probable that under certain conditions the bird loses its power of resistance against the protozoön, which multiplies accordingly into a very large number; hence the well-pronounced symptoms. In heavily infected grouse, Fantham describes the symptoms as follows: The infected birds are less active; drooping of their wings and the habit of constantly looking downwards are conspicuous. They stand about more than normal birds. They show increased appetite and drink more; finally succumb to death from malnutrition.

Enterohepatitis (blackhead) of turkeys is due to the presence of *Histomonas meleagris* (Smith 1895) Tyzzer 1919. The disease seems to be widely distributed, chiefly among domestic turkeys and less frequently chicks. The disease is characterized by thickening and ulceration of the ceca and by extensive necrosis of the liver. The head frequently shows discoloration, hence the name. Smith (1895) found an organism which he considered an amoeba, *Amoeba meleagris* in the lesions in the intestines and liver of diseased turkeys. Tyzzer (1919) found that the organism possessed one to four flagella and could invade the tissues in amoeboid form; hence the parasite is now considered a flagellate. Subcutaneous inoculation of young turkeys with diseased tissues results in new infection. It is now commonly noted that *Heterakis papillosa* infection is favorable for the invasion of *Histomonas meleagris*.

**Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16**

A veterinarian is reported to have opened a beauty shop for dogs in Paris.

Mr. Forrest W. Knepper, of Etna Green, has been appointed a member of the Indiana State Live Stock Sanitary Board to succeed Mr. John W. Van Natta, of Lafayette.

ATYPICAL SYMPTOMS AND LESIONS OCCURRING IN CHICKS HARBORING BACTERIUM PULLORUM

By H. J. STAFSETH and E. P. JOHNSON

Department of Bacteriology, Michigan State College, East Lansing, Mich.

Within the past few months we have had occasion to examine chicks from various parts of Michigan, that have manifested symptoms and lesions somewhat different from anything encountered by us before. Since veterinarians may be called upon to diagnose conditions of this kind, we thought that a brief description of our findings would be of interest, as well as of value, at this time. We first noticed the condition to be described in chicks about two weeks of age that had died and were sent to us by the hatcherymen for examination. Since that time chicks with similar symptoms and lesions, coming from different parent stock, fed on different feeds and kept under different conditions have been sent to us for examination. The symptoms are described by poultrymen and as they have been observed by us are briefly as follows.

SYMPTOMS

The owners invariably report that the affected chicks develop an abnormal thirst, some to the extent that they remain at the water-fountains continuously. This is usually followed by a watery, brownish-colored diarrhea that is often so marked that it is impossible to keep the floor of the brooder-house dry. The chicks usually swell up and become very large. Owners speak of them as being bloated, or puffed up. In all cases brought to our attention and in those observed, these symptoms have occurred at the age of six to fifteen days. Usually all chicks showing these symptoms die after from four to six days of illness. In a number of cases the feed has been changed at about this time and the fact that losses have stopped at about the time the feed was changed has led some poultrymen to think that the feed was at fault.

FEED BLAMED FOR AILMENT

It so happened that a large number of flock-owners who have experienced this trouble were using one particular brand of feed, which made it reasonable for them to be at least suspicious as to the wholesomeness of this feed. However, in the course of our investigations we have found cases where entirely different feeds were used and several flock-owners using the suspected feed

report no trouble but on the other hand report excellent results. Because of the abnormal thirst, mentioned above, we were requested to have the suspected feed analyzed chemically. Several samples of feed, taken from places where this trouble existed, were brought to the Experiment Station chemist to find out more about the salt content. He found that the various samples contained from $1\frac{1}{2}$ to 2 per cent salt. This analysis would show not only added salt but also the salt content of meat and milk in the feed, or the total amount of salt present. Judging from experiments carried out by Mitchell, Card and Carmen,¹ at the University of Illinois, this amount of salt is not harmful to chicks. The chemist further stated that he found no ingredients that, in his opinion, should be harmful to chicks. To satisfy ourselves we have fed considerable amounts of the feed to experiment chicks and have found no detrimental effects after two weeks of feeding.

AUTOPSY AND BACTERIOLOGICAL FINDINGS

A postmortem examination of all affected chicks revealed a typical picture of dropsy; the subcutaneous tissues were filled and distended with a watery, edematous fluid, often being gelatinous in consistency; the thoracic and abdominal cavities were usually filled with the same fluid; the heart was invariably very thin-walled and flabby; frequently the liver was light yellow or ochre colored and very friable; and usually considerable unabsorbed yolk, that was either of a liquid or cheesy consistency, was found.

On making a bacteriological examination of the tissues we invariably found *Bacterium pullorum*. We have also encountered an organism that is a gas-producer, fermenting glucose, lactose, maltose and mannite, but on feeding this and injecting it into susceptible chicks we have been unable to produce either the symptoms or the lesions described above. Thus it seems probable that these symptoms and lesions are different manifestations of bacillary white diarrhea infection that may be brought about by some contributory influence that has not yet been discovered.

While we do not pretend to have solved this problem, it was thought advisable to call the attention of veterinarians and others to this condition, as it may be present in other localities without being recognized.

REFERENCE

- ¹Mitchell, H. H., Card, I. E., & Carmin, G. G.: The toxicity of salt for chickens. Ill. Sta. Bul. 279 (1926), pp. 133-156.

TECHNIC FOR PERMANENT BALSAM MOUNTS OF SMALL NEMATODES

By J. H. RIETZ, Morgantown, W. Va.

It is the object of this note to direct attention to a simple technic in the preparation of balsam mounts of certain parasitic nematodes, by means of which I have found it possible to avoid the clouding and wrinkling that follows the mounting in ordinary balsam.

While working in the Zoological Laboratories of the Graduate School of Ohio State University, during the winter of 1925-1926, I experienced almost complete failure, for a considerable time, in attempting to make balsam mounts of the anchylostomae, ascaridae, hetarakidae, trichurinae and others of the parasitic nematodae. The specimens were cleared with satisfactory results, but when they were mounted in ordinary balsam, clouding and wrinkling resulted, so that the internal structure could not be studied. In fact, portions of the specimen often became nearly black. Upon consulting the literature on technic, by various authorities, the following statement by Braun and Lune was found, referring to nematodes: "Mounting in Canada balsam or other gums is almost impossible, owing to the almost unavoidable shrinking of the cuticle when specimens have been cleared in creosote or turpentine."

The thought occurred to me that possibly the clouding and wrinkling might be due to the solvent in which the balsam is dissolved rather than the balsam itself.

The following technic was finally adopted, with the result that the mounts are entirely satisfactory for study, after a period of more than one year following preparation.

Creosote is in very general use as a clearing agent in parasitic work. Therefore this reagent, instead of xylol, was used as the diluent for the balsam.

The xylol is driven from ordinary xylol balsam by subjecting it to continued gentle heat until all the xylol has evaporated and the balsam becomes hard when cold. Heat is again applied to remelt the balsam, then creosote is added until the mixture is of the proper consistency for use in mounting the specimens. Dry neutral balsam may be used in the same manner after melting and thinning with creosote.

The specimens were dehydrated in the usual manner, and cleared in creosote or lactophenol. When lactophenol was used, it was necessary to wash the specimens in pure creosote for a time, varying from a few minutes to one-half hour, before mounting in the balsam.

The specimen thus prepared is mounted on a slide in creosote and under a cover-glass, placing the parasite on the slide parallel to the long axis. Examination of the specimen is now made, using the microscope. The specimen is rolled into the position desired by gently applying lateral pressure to the cover-glass. Quite crooked specimens may be made to assume almost any position desired by using care in this operation. Manipulation after mounting in balsam is not satisfactory.

After the specimen is in the proper position, the slide is placed on a *very slightly warm* hot plate and a filter paper carefully applied to withdraw the creosote. At the same time the balsam (creosote balsam) is allowed to flow under the opposite side of the cover-slip. If this operation is carefully carried out, without moving the cover-slip, the specimen will not change position.

Creosote evaporates slowly, consequently the hardening of the balsam is slow. The hardening, however, may be hastened by placing the preparation in the dry oven at 37° C. for three or four days.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***



Heart of Philadelphia.

THE IMPORTANCE OF VETERINARY MEAT AND DAIRY INSPECTION IN MAINTAINING THE HEALTH OF TROOPS*

By EARL F. GRAVES, *Manhattan, Kansas*

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"Health Wins Again! It was the proudest moment in Bobby's full young life. An Eagle Scout at last. Robust health, the result of outdoor life and a balanced diet, had brought the stalwart Bobby to leadership and honors!" So reads an advertisement in a recent copy of the *Saturday Evening Post*. See how "leadership and honors" are dependent on "diet." Does not "diet" depend on food, and when we think of food do we not mean wholesome food? Of course we do, and wholesome food is the result of food inspection.

Diet, leadership and honors! Does not one see in these three words the importance of veterinary meat and dairy inspection in maintaining the health of troops? To attempt to explain why health is desirable would be ludicrous indeed. Health—that much desired thing for which millions of people pray. Only very recently a multimillionaire wrote to his stockholders with reference to his ill health. A short time ago a newspaper story related how one of Europe's wealthiest men is starving to death because of digestive disturbances. These two illustrations are sufficient. Think what a terrible thing it would be if the ills of but one of these unfortunate men were applied to the men of our army. An army either bedridden or starving would be worse than no army at all and utterly useless, yet, if it were not for the skill and knowledge of the inspectors who carefully examine all the food consumed by our army, such a circumstance is not altogether inconceivable.

The Veterinary Service as a part of the Medical Department is charged in peace and war with duties falling under two definite heads. I will not discuss those duties in connection with the animals of the army, but those concerned with the food supplies of troops which are of animal origin.

The military Veterinary Service protects solely the interests of the army, continues the inspection procedures of authorized

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federal, state or municipal agencies, accepting those deemed competent, supplementing them where they are incomplete or entirely absent and repeating them only when they are manifestly inadequate or incompetent.¹

The object of veterinary meat and dairy inspection is to protect the health of troops by preventing the purchase or issue of meat and dairy products which are unsafe or unsuitable for food purposes. This protection is accomplished by repeated inspections, such as prior to purchase by the government, upon receipt, during transportation and storage, and finally at time of issue to troops.

Regulation of the diet or hygiene has for its purpose the retaining and strengthening of the health of the human, or animal, organism by increasing its internal resistance and by preventing any noxious effects.² This regulation consists in such activities as are concerned with the procurement of wholesome meats and meat and dairy products with reference to the health of man and the dangers associated with the consumption of diseased and unsound meat and dairy products.

MEAT INSPECTION COMPREHENSIVE

Meat inspection is quite comprehensive in its scope and extends to all the food animals which are customarily used in producing the principal amount of meat food marketed for human consumption, namely, oxen, swine, game, poultry, fish, crustaceans, mollusks, reptiles and amphibians.

There are three kinds of muscle in the animal body. The striated, such as are the fleshy muscles of the body; the non-striated muscles, which are the small muscles of the intestines; and the heart muscle, which is a type of striated muscle. Only the striated muscle is consumed as meat proper though, of course, the heart is eaten as are the intestines when used in the preparation of various meat products.

It is a known and established fact that animals and man have certain diseases which are intercommunicable and certain terrible and horrifying conditions may appear in man as the results of ingesting meats and dairy products which are diseased or in an unwholesome condition.

Edelman states that the oldest data in the history of meat inspection are the food edicts of the Egyptians. It was not, however, until the year 1857 that an epidemic of disease was

first traced to a milk supply and the vast field of dairy bacteriology and hygiene thus opened.

Now, the importance of meat and dairy inspection to troops is of the same great importance as such an inspection is to ourselves. To get a view of different opinions on the subject, I approached ten different people with the questions: "Would you eat unwholesome meat or drink unwholesome milk?" and "Do you know such meat or milk when you see it?"

To these questions each of the ten persons replied "No."

In other words, people of average, normal, high-grade American intelligence and standards would not eat diseased foods if they knew it, but they were helpless to protect themselves for they did not know what constituted unwholesome food, until they had become ill from some food source.

If the health of troops is to be maintained, then the most careful and rigid inspection of their food must at all times be maintained.

PUBLIC MUST BE PROTECTED

For some unknown reason federal governments and the public at large seem to be considered as special victims for a certain type of business men who consider that it is always "open season" on their own nation. These men are activated by greed and emulate their biblical brother who said, "Am I my brother's keeper?"

I am at this time referring to the individual who would knowingly sell to the market, diseased animals for slaughter to be used as meat and food. The following incident which actually happened in my own community a few days ago may be duplicated many times and is mentioned as a concrete example to illustrate the importance of meat inspection and its great value.

A cattle-feeder, observing an outbreak of a pathological condition among the animals which he was fattening for market, called in several veterinarians for consultation. The etiology was such as to require several days for determination and held up both the diagnosis and treatment. This being irksome to the feeder and also meaning considerable money to him, he decided to realize what he could from the lot and, accordingly, sold some twenty animals to an abattoir for meat purposes. Several of the animals had died and more were in a dying condition. Meat inspectors detected these animals and condemned sixteen of them. Had it not been for the inspector, this meat would have been sold to this man's very neighbors. It might have been con-

signed to fill a contract for meat for the army, or sold to some mess sergeant for the table of some organization at a nearby army post. Had the distribution of this diseased meat not been stopped, it might have meant the death or illness of many men, the payment of thousands of dollars, the darkening of many homes and the saddening of many hearts.

Two illustrations will not be superfluous. Let me offer one more proof that diseased meat will be sold if it is not prohibited. Yesterday, after laboratory examination, I demonstrated Negri bodies in the brain tissue of a cow. A diagnosis of rabies was given to the animals' owner. The man said that since his remaining two cows were exposed at the same time, it was likely that they too had the disease and he guessed that he would sell them to his local abattoir for meat. The abattoir is five or six miles from a very large army post, and it would be an easy matter for this meat to find its way to an army mess. Even though the greatest danger may be in the handling of this flesh, in the judgment of the Bureau of Animal Industry, "—meat of rabid animals is dangerous to health and unfit for food, it should be condemned."

Meat inspection means more than the assurance of tender cuts for the dinner table. Far too little thought is given to the problems of the meat inspector. I am reminded of a story told to me of a little boy who went into a meatshop and demanded a certain amount of steak—to be cut into strips two inches wide and eight inches long. On being questioned concerning the odd shape of the cuts, he replied that he intended to use them as hinges for his rabbit hutches.

Of course palatability is desirable, but the inspection of meat goes much deeper than a mere consideration of a portion's tenderness.

THE DETECTION OF SUBSTITUTES

Horse meat is considered a rare delicacy throughout the vast Kirghize Steppes of Turkestan and even western Europe, but it is not so esteemed in our own United States. Inspection then to detect fraud and substitution is important. A test for horse meat has been evolved. The suspected flesh is boiled and the resultant extract is treated to a solution of iodine and a specific color reaction results in the event of the presence of equine flesh; another more complicated procedure is termed the medico-legal test.

The detecting of other substitutions is of considerable importance and the dressed carcass of the cat must be differentiated from that of the rabbit; the goat from the mutton, and the dog from the swine. All have their distinguishing points, but it takes an expert to see through the clever attempts of unscrupulous dealers to defraud the purchaser.

Important as is the detection of fraudulent substitutions, yet even more important is the detection of diseased meats. One could, with relish and impunity, consume the flesh of the horse, cat or dog and be none the worse for the experience if it were not diseased, and one could partake of the most savory pork roasts with fatal results, if it were of an unwholesome nature.

Certain human parasites spend their larval, or intermediate, stage of their life cycle, in the bodies of certain food-producing animals and in case such flesh is eaten without having been prepared properly, the larvae develop into adult parasites in the human intestine.

Tapeworms are probably the most common parasite so transmitted. Meat from the hog infested with the larvae of one variety of this parasite is commonly known as "measly" pork, and contains small, spherical, white areas, the so-called "measles" in the muscular tissue. If the meat is eaten uncooked or only partly cooked by human beings, the capsule of the cyst is digested away and the liberated larvae are free to develop into the *Taenia solium*, or tapeworm, of man.

Cattle also are the intermediate hosts of another tapeworm of importance to man. The *Cysticercus bovis*, which is a stage in the life history of *Taenia saginata*, becomes encysted in the muscles and on being ingested is liberated and develops in the intestine of man. Meat so infested is known as "measly" beef and it is the duty of the meat inspector to detect the condition.

An example of destruction caused by tapeworm cysts is noted by Underhill,³ in his text concerning parasites of animals, wherein he describes the case of a man, who, having been infested by the cystic stage of *Enchinococcus granulosus*, a dog tapeworm, had for forty-three years a swelling which gradually extended over his face until it reached the size of an infant's head. It was removed by surgical interference.

THE DANGERS OF TRICHINOSIS

Another parasite important to man, found in his meat supply, is the *Trichinella spiralis*, which causes trichinosis of man. This

parasite is a minute worm inhabiting the muscle tissue of swine. The great danger of trichina to man was demonstrated scientifically for the first time in the epidemics of trichinosis at Hettstedt, in 1863, where one hundred and sixty persons became infested and twenty-eight died.

Tuberculosis is another dread disease of man which meat inspection is helping to control.

The value of meat inspection to troops is well demonstrated in the incident which occurred during the Spanish American War. The army at that time did not have meat inspection and a large amount of preserved meat was shipped to the American troops in Cuba. This product was unfit for human consumption and the resulting loss to the Federal Government in both money and man power was enormous. In June, 1916, the record of this sad occurrence was perhaps partly, at least, responsible for the fact that the scope of the army veterinarian was broadened so as to include the inspection of meats and meat food-products which were destined for troop consumption. After the introduction of this much-needed service, no similar circumstance has occurred.

It should also be pointed out that there is considerable danger to troops, who, while on maneuvers or in action, chance to kill an animal with the intention of consuming it for food. This is not an hypothesis but actually has happened. Such an incident was related to me by an army veterinarian who induced the men to turn such a beef animal over to him for inspection before they used it for food. Upon careful examination of the carcass he found it to be totally unfit for human consumption.

THE INSPECTION OF CANNED MEATS

The inspection of canned meats is very important and the detection of "leakers," "swellers," "springers," and "flippers" not only saves the Government money but also saves the troops who would consume these spoiled products much pain and gastrointestinal disturbances. Money saved in the purchase of such products may well be applied otherwise to the benefit of troops.

It was told by an army officer, whose duty it was to inspect certain canned meats at a packing-plant, that he discovered a can-washer to be leaving an ounce of water in each can, contrary to specifications. This machine was at once shut down and all cans so processed were immediately condemned and a big money-saving was accomplished for the benefit of the army.

Before turning to the subject of dairy inspection, let me offer one more illustration in behalf of meat inspection and the health of meat-consumers.

Several days ago there was presented for inspection, at the laboratory with which I am connected, a sample of meat. The meat had been *cooked* and placed upon a table to serve. Upon cutting into the meat, the host and guests were horrified to discover that it was literally crawling with live maggots. Upon identification these were found to be the larvae of *Piophilæ casei*, a small black fly. Further inquiry into the case brought to light the fact that the meat had been purchased at a butcher's shop which has secured the meat from a local abattoir, in a certain community. Investigation revealed that the meat had been infected while in the packing-plant and that this plant does not have veterinary inspection of meat. Inspection would have prevented this meat from ever reaching the sales block.

Had this meat been purchased by some military organization for its mess and the condition not discovered until too late, it would have meant loss of money and an entire unit on sick call. Furthermore it would have meant an unpleasant call "on the carpet" and much embarrassment for mess officers.

Well and properly fed men show less tendency to "go over the hill." Each deserter costs a considerable sum of money to the federal government and much paper work is entailed. Meat inspection guards the table of troops and troop health, and thus plays a most important part in helping to make the United States Army the greatest army in the world and an organization to which all able-bodied, highly intelligent men are proud to belong.

MILK A DELICATE PRODUCT

Milk is universally recognized not only as one of the most important foods but a food very easily contaminated and very quickly decomposed. Every phase of contamination with dirt, filth, flies, saprophytic and pathogenic bacteria, together with methods of production, preservation and control has been covered by many investigations. Although there is great diversity of opinion in matters of detail and in the estimation of the relative importance of various factors in production and handling, some fundamental requirements for clean, sound, safe milk are generally accepted. The desire to sell milk does not establish the right to do so. No one should be permitted to deal in milk without demonstrating possession of the essential

equipment and his knowledge of how to produce it clean and to market it in a sound condition.⁴ Milk in the udder of a healthy cow is rarely sterile. Milk holds a peculiar position among food-stuffs in that it is an excellent medium for the growth of many microorganisms, both the ordinary saprophytic varieties and those pathogenic to man.⁵

Before discussing some of the dangers of consuming unwholesome milk, it is interesting to consider some facts which show the importance of milk and thus gain an idea of what widespread results are possible in the sale of impure dairy products.

According to Doctor E. V. McCollum, of Johns Hopkins University, the average American family spends twenty per cent of its food budget for milk, and should spend thirty per cent.

Two hundred and ninety million pounds of wholesome milk were used in the production of milk chocolate alone last year.

The value of milk produced in this country during 1926 was greater than that of all the gold and silver mined in the United States during the past twenty years.

The amount of both milk and dairy products consumed by troops is enormous. Anyone familiar with garrison life knows that aside from the regulation issue of dairy products, a large amount of milk and ice cream is purchased at exchanges and canteens. Besides being a most palatable confection, it is at the same time perhaps the most nearly perfect food.

MILK EASILY DIGESTED AND ASSIMILATED

The United States Department of Agriculture has demonstrated by experiments that milk is very thoroughly digested, that as high as 98 per cent of the milk protein and 99 per cent of the fat and carbohydrates are assimilated. Milk contains three of the most important growth-promoting vitamins. In spite of the virtues of dairy products, these same foods are charged with the dissemination and spread of many diseases. Five diseases of great importance to man are especially transmissible by means of milk and have been so traced many times. Tuberculosis, typhoid fever, diphtheria, scarlet fever and Malta fever are readily carried by milk, to say nothing of septic sore throat, foot-and-mouth disease and gastro-intestinal disorders.

It will be sufficient, to illustrate the ease with which pathogenic conditions are spread by milk, to quote from Doctor John W. Trask, former assistant surgeon of the Public Health and Marine

Hospital Service. Doctor Trask states in Hygienic Laboratory Bulletin 41, that of a total of 138 epidemics of typhoid fever, 109 instances were traced to milk coming from farms where the disease had prevailed. The manner of pollution varied from cattle standing in sewage water to sick attendants and even to milk standing in a sick-room before delivery.

Doctor Trask also gives the details of seventy-four epidemics of scarlet fever spread through the medium of the milk supply; and likewise the details of twenty-eight epidemics of diphtheria.

As an example of the difference between pure and impure milk supply, directly affecting the armed forces of this country, is the case of the United States Naval Academy, Annapolis, Maryland. The Academy, prior to October, 1911, received its milk supply from neighboring scattered dairies. In the fall of 1910, an outbreak of typhoid fever occurred. This was traced to the milk supply of the Academy and it was decided to make the school independent of the small dairies by establishing its own milk source. After the establishment of the sanitary dairy, the sick days from gastro-intestinal disorders, based on attendance on the first of the months, dropped from as high as twenty-five in July (three-year average) to about six during November and December, for a three-year average. It is at once seen that sickness from the unclean milk source was greatly diminished by the pure milk supply.⁶

The milk products are as guilty in the spread of infection as their parent. Butter may contain the tubercle bacilli and hold it unchanged, although frozen in cold storage for a long period of time.

The tubercle bacilli may also become mixed with the ingredients of cheese during manufacture and remain virulent for over three months.

THE VALUE OF THE TRAINED INSPECTOR

The source of milk contamination is so varied that the tracing of an epidemic to the source of trouble is extremely difficult and it is in these cases that the true worth of the trained inspector is realized. In a nearby large city, rather recently, the bacterial count of the milk supply suddenly jumped from the routine laboratory count to a tremendous number. City health authorities were at a loss to account for the rise and the plant was in danger of being shut down. A trained inspector was called into consultation and after a study of the case discovered that milk

from only a certain sized bottle was of the unusual count and upon tracing the handling of these bottles it was disclosed that the machine in which they were supposed to be washed and sterilized was not functioning, due to a faulty steam connection. The bottles were being refilled after only a partial cleansing.

From the hands of the dirty milker may come millions of germs. He may spit upon his hands as he begins to milk, since this ancient custom is not peculiar to ditch laborers alone. The tubes of the milking-machines are frequently dropped in the stable manure.

Air and dust of the stable may settle in the milkpail, and the type of pail used is an important factor in controlling the bacterial count. Dirt may fall from the cow's sides and udder. The water supply of the dairy may be a carrier of various pathogenic organisms. During transportation some person may dip into the cans or bottles for a "free" drink and thereby expose many persons to disease.

Having considered the diseases which are transmissible by milk, it is seen at once the great importance of dairy inspection in the maintenance of health in troops. It is not possible to examine each bottle of milk, each can of ice cream or each pound of butter, cheese or other product, therefore the most practical plan to adopt is the establishment of clean and sanitary measures at the very source of the dairy products. Inspectors should make actual examination of a dairy farmer's premises and note the equipment and methods employed at each place.

In speaking to the Senate in behalf of a bill to regulate the importation of milk and cream into the United States, Senator Gillette,⁷ of Massachusetts, said, in part: "We have found in this country that the best method of safeguarding the milk supply from the standpoint of sanitation is by an inspection of the herds and the dairies."

MANY THINGS TO BE CONSIDERED

In conducting a dairy inspection, many things must be considered, such as the health of the cattle furnishing the milk, the location of the stables, the utensils and milkroom used, the manner of cleaning the equipment, cleaning the cows before milking and handling of the milk and its cooling. The health of the attendants is likewise inquired into. Since all the above points are so closely related to the production of clean and wholesome milk, it is necessary that the ideal conditions be maintained as

nearly as possible at all times. To accomplish this, regular inspections are necessary at times not previously announced. Bottles must be taken at random from among the trays of delivery wagons to ascertain the bacterial count. Very often delivery wagons are "salted" with especially prepared bottles which the vendor will hand to the inspector. This, of course, must not be allowed, as it does not give a true picture of the market milk.

Where a portion of the milk supply may come from local cows, as might be maintained on an "organization" farm, it should be the duty of the veterinary officers to inspect and criticize them as severely as they would any civilian concern.

Medical history is full of case reports relating to various epidemics and it is so well known that dairy products do carry disease when they are of an unwholesome nature that milk and dairy inspection is more than ever in demand. This is evidenced by the fact that state and city officials are becoming more and more concerned in guarding the milk supply of their various communities. Fourteen states now have laws enacted or have issued regulations requiring the tuberculin testing of cattle to safeguard the wholesomeness of the milk.

Ice cream is peculiarly an American dish, though it was first made in Italy as early as 1756. It did not reach the United States until the first part of the nineteenth century, when Dolly Madison served it at a White House dinner in the year 1809.⁸

Scientists are in complete agreement on the fact that the vitality of the American people depends in large measure on the amount of milk that is consumed in some form. The milk must, of course, be pure and safe, for there is nothing more potentially dangerous than impure and dirty milk. In making ice cream, especially on a large scale, it is customary to pasteurize the milk first, for no milk is absolutely safe.⁸

Disease can be carried by means of ice cream, just as it may be conveyed in milk or water that is contaminated. Sanitation with respect to ice cream should not end at the factory, but should be continued throughout the career of the product. Places that dispense ice cream should be maintained in a sanitary manner and those that are not should be shunned in favor of those that are.⁸

It is important that the inspection of ice cream factories and dairies supplying ice cream to troops and organizations be at all times most diligently accomplished.

Doctor Harvey Wiley, in 1908, wrote as follows:

A study of the literature dealing with diseases traced to the eating of ice cream shows that not only are isolated cases more or less severe, even sometimes resulting in death, fairly numerous, but widespread epidemics have been caused by the toxicity of the substance. Such diseases are, of course, of gastro-intestinal origin.⁵ It is a recognized fact that many cases of violent poisoning which arise from eating cream or ice cream are due to insanitary conditions surrounding the dairy or ice-cream factory.⁶

And thus it goes, what applies to one product applies to all. The vendors of all the various meat and dairy products will attempt to avoid financial loss by selling to supply sergeants and those making purchases for the mess of organizations such stores as are in danger of spoiling or are not fit for consumption. The health of troops can be maintained only by the inspection of meat and dairy products. The inspection of such foods requires the skillful attention of the trained man and such a man is found only in the modern, properly educated veterinarian, who has studied conscientiously to prepare himself for such a task and maintains an above-average position in the profession.

Health in troops means efficient men. Efficient men are well-trained men. Well-trained men assure the continuance of the leadership of this nation among the nations of the world.

Health, leadership and honor—the result of veterinary meat and dairy inspection in maintaining the health of troops.

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Meet thy friends in the Friendly City— Philadelphia, September 13-14-15-16

E. J. Martindale, of Coleman, Mich., was arrested for practicing veterinary medicine and surgery illegally, on April 27. His case came up for trial on May 7 and the defendant pleaded guilty to the charge before Justice Staley, of Gladwin, Mich. Martindale was assessed \$50.00 and costs by the court. The arrest was made by Dr. Floyd E. Myers, veterinarian, of Gladwin, who is sheriff of the County.

THE RELATIONSHIP OF THE LETHAL POWER TO THE SKIN-REACTING POWER OF TUBERCULIN*

By M. DORSET, R. R. HENLEY and H. E. MOSKEY

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INTRODUCTORY

The nature of the response of tuberculous guinea pigs to tuberculin is dependent upon the mode of administration. Intradermic injections give rise to marked local reactions, consisting of swelling and hyperemia, with necrosis of the skin immediately surrounding the point of injection. Intraperitoneal or subcutaneous injections, on the other hand, cause a severe general reaction which is evidenced either by death within a comparatively short time or by general depression of varying degrees of intensity. In both cases the degree of the reaction is affected by the potency of the tuberculin and the dose employed, as well as by the degree of sensitiveness of the injected guinea pigs.

Both the general toxic reaction and the skin reaction have been employed to standardize tuberculin. The first has for many years constituted the official German method for determining potency and is employed quite generally in the United States and other countries. As a general rule, tuberculins which fail to kill sensitive tuberculous guinea pigs within 24 hours in a dose of 0.25 grams, O. T., are regarded as being below standard.

As a result of the observations of Lewis and Aronson, and others, the intradermic skin reaction has recently come more and more into use. Calmette, following a recent study of methods of standardization, prefers this method to any other. It consists essentially in injecting intradermally, on the shaved abdomen of sensitive guinea pigs, a series of dilutions of the tuberculin to be tested and an identical series of dilutions of a standard tuberculin. The two series of injections are made at the same time on the same guinea pig. The potency is determined by comparing the intensity of the reactions produced by similar dilutions of the two tuberculins, or by determining the greatest dilution by which a positive reaction is caused.

So far as we are aware, no attempt has been made to determine the essential identity of the two reactions. Is the lethality of a tuberculin an accurate guide to its power to produce skin reac-

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tions? Is the death of tuberculous guinea pigs, following the injection of tuberculin, caused by the same substance as that which gives rise to the intradermic reaction? We have collected some experimental data bearing on these questions and desire in this paper to present a summary of the results.

EXPERIMENTAL

The tuberculins used in our experiments were all prepared from cultures of *B. tuberculosis*, human type. The cultures were propagated for 8 to 28 weeks, either upon a synthetic medium, which we have previously described,¹ or upon peptonized glycerinated beef broth. The reaction at the end of the period of cultivation varied from pH 5.2 to pH 5.4 in the cultures on the synthetic medium and from pH 5.2 to pH 6.4 in those on the broth. After being heated in the Arnold sterilizer for three hours, the bacteria were removed by filtration and the culture fluid evaporated to one-tenth of the original volume.

DIALYSIS EXPERIMENTS

The different batches of experimental tuberculins were prepared in amounts of 240 cc, representing 2,400 cc of the original culture fluid. This concentrated tuberculin was distributed in fish-bladder membranes, two or more bladders being used for each tuberculin. These bladders were suspended in 4,000 cc of distilled water, which was changed daily. The dialysis was carried out in a room kept at a temperature of 34°-40° F. to avoid spoilage. The time of dialysis varied from three to ten days in different experiments. Each day's diffusate was evaporated at an average temperature of about 70° C. and tested either separately or after being combined with that obtained on other days. While the amount of material that passes through the dialyzers is very much greater at the beginning, yet the diffusion is not complete even after fifteen days. It was thus evident that any separation which might be accomplished in this way would probably proceed at a slow rate. Very prolonged dialysis always involved the possibility of spoilage; therefore we have arbitrarily assumed that if any active material passed through the dialyzers, it would be at the average rate of one-twentieth of the whole in each period of 24 hours, and have fixed the dilution of the diffusate accordingly. The residue remaining in the dialyzers was diluted to a uniform volume of 1,920 cc for each original lot of 240 cc of O. T.

Proceeding according to the plan outlined above, we have dialyzed and tested the residues and the diffusates from 16 separate lots of O. T. Each portion of each lot was tested on guinea pigs for lethal power and for power to produce skin reactions. The intradermic tests were made by injecting 0.1 cc into the skin of the shaved abdomen of sensitive tuberculous guinea pigs. The residue from dialysis and the diffusate were always tested simultaneously on the same guinea pigs. The lethal power of each pair of products was tested by injecting intraperitoneally 2 cc per 500 grams weight into each of three of the same lot of tuberculous guinea pigs. The sensitiveness of the lot of guinea pigs was always proved in advance by the injection of several with 0.25 cc of O. T. of known potency.

Table I summarizes the results obtained from three lots of O. T. made from cultures on the synthetic medium. In our beef-broth tuberculins, while in general there was a close agreement with those prepared from the synthetic medium, there

TABLE I.—*Tests of products of dialysis*

MA- TERIAL TESTED	VOL- UME OF SOLU- TIONS (cc)	SKIN TESTS ¹		TESTS OF LETHAL POWER ²			
		TUBERCULOUS GUINEA PIGS	NORMAL GUINEA PIGS	TUBER- CULOUS GUINEA PIGS		NORMAL GUINEA PIGS	
				No. IN- JECTED	No. DIED	No. IN- JECTED	No. RE- ACTED
Tuberculin No. 1. 240 cc O.T. Dialyzed 3 days.							
Residue	1,920	5+ 5+ 5+ 3+ 2+	— —	8	7	2	0
Diffusate	288	? — ? — —	— —	11	8	2	0
Tuberculin No. 2. 240 cc O.T. Dialyzed 5 days.							
Residue	1,920	5+ 5+ 4+ 3+	— —	8	6	2	0
Diffusate	480	+ ? — —	— —	11	11	2	0
Tuberculin No. 3. 240 cc O.T. Dialyzed 10 days.							
Residue	1,920	3+ 4+ 4+ 5+ 3+		6	4		
Diffusate	960	— — — — —		9	9		

¹Dose—0.1 cc of solution.

²Dose—2.0 cc of solution per 500 grams guinea pig, intraperitoneally.

appeared to be more tendency for the diffusates to cause slight intradermic reactions.

It is clearly evident from table I that the residue was highly active as an excitant of the specific skin reaction and moderately potent as far as lethal power is concerned. On the other hand, the diffusate was practically devoid of power to cause skin reactions in guinea pigs, yet possessed at least as great lethal power as the residue. In other words, in the case of these two products the lethal power afforded no accurate guide to the skin-reacting power.

These observations suggest to us that the contradictions in the literature concerning the dialyzability of the active material in tuberculin may be due in part at least to the method of testing. In our experiments, if we had depended upon the skin test we would have declared that the active material did not pass through the dialyzer, whereas if relying entirely upon the test of lethality the conclusion would have been the reverse.

AMMONIUM SULPHATE EXPERIMENTS

Since the dialysis experiments showed that at least a part of the lethal material in our tuberculins was dialyzable, while the substance causing skin reactions was almost wholly withheld, it seemed evident that the molecules of the two substances must be of very different size. This suggested that the two might be separated by salting out as well as by dialysis. Various authors have reported the precipitation of the active principle of tuberculin by ammonium sulphate, and Seibert and Long² have recently, as a result of extensive studies, reported that the active principle of tuberculin is completely precipitated by saturation with ammonium sulphate. In their work, Seibert and Long used only the skin test as a measure of potency.

In our own experiments we have examined six different tuberculins prepared from cultures on the synthetic medium previously described.¹ The reaction of the different lots varied from pH 5.2 to pH 5.4 after sterilization. The culture filtrates were evaporated to O. T. strength and then diluted with an equal volume of distilled water before addition of ammonium sulphate. This dilution was found to facilitate flocculation and subsequent filtration. After saturation with ammonium sulphate the precipitate was removed by filtration through hardened paper. The precipitate was taken up in distilled water and reprecipitated by saturation with ammonium sulphate, after which it was again dissolved and diluted to the desired volume for test.

To the original filtrate from the saturated ammonium sulphate solution, two volumes of absolute alcohol were added. This alcohol served to precipitate most of the ammonium sulphate which was removed by centrifuging. The clear alcoholic solution was evaporated to a low volume and made to 150 cc with distilled water. In order to remove still more of the ammonium sulphate, 450 cc of absolute alcohol was added to this concentrated solution. The precipitate was removed with the centrifuge and the clear alcoholic solution was again evaporated to a low bulk to remove the alcohol. The concentrated solution thus obtained was diluted to the desired volume before being tested.

In table II the results obtained in typical experiments are given.

The ammonium sulphate precipitate seemed to possess all of the intradermic potency and a part of the lethal power, while the

TABLE II.—Tests of ammonium sulphate fractions

MATERIAL TESTED	VOL- UME OF SOLU- TION T'ST'D (CC)	SKIN TESTS ¹		TESTS OF LETHAL POWER ²				
		TUBER- CULOUS GUINEA PIGS	NORMAL GUINEA PIGS	TUBERCULOUS GUINEA PIGS			NORMAL GUINEA PIGS	
				No. IN- JECTED	No. DIED	No. DE- PR'S'D	No. IN- JECTED	No. RE- ACTED
Tuberculin No. 10. 240 cc O. T.								
Original	1,920	3+ 2+ 3+	— — —	Not Tested				
(NH ₄) ₂ SO ₄ precipitate	1,920	3+ 3+ 2+	— — —	3	0	3	2	0
(NH ₄) ₂ SO ₄ filtrate	1,920	— — —	— — —	3	2	1	2	0
Tuberculin No. 11. 240 cc O. T.								
Original	1,920	4+ 2+ 4+	— — —	3	1	2		
(NH ₄) ₂ SO ₄ precipitate	1,920	3+ 1+ 4+	— — —	3	0	1	2	0
(NH ₄) ₂ SO ₄ filtrate	1,920	— — —	— — —	3	1	2	2	0
Tuberculin No. 12. 240 cc O. T.								
Original	1,920	Not tested		3	2	1		
(NH ₄) ₂ SO ₄ precipitate	1,920	4+ 4+ 2+	— — —	3	1	2	2	0
(NH ₄) ₂ SO ₄ filtrate	1,920	— — —	— — —	3	2	1	2	0

¹Dose—0.1 cc of solution.

²Doses—Tuberculous guinea pigs—2 cc of solution per 500 grams guinea pig, intraperitoneally.
Normal guinea pigs—3 cc of solution per pig, intraperitoneally.

filtrate exhibited no skin-reacting power, yet contained the greater part of the lethal material.

DISCUSSION

As a result of the above-described investigations, there seems to be no question that there were present in our tuberculins at least two active substances. One of these was capable of inducing typical skin reactions in guinea pigs and at the same time possessed moderate lethal power. The other was decidedly lethal for sensitive guinea pigs yet caused no skin reactions. The fact that the residue in the dialyzers as well as the ammonium sulphate precipitate always displayed a certain amount of lethal power, suggests that the *skin-reacting principle* may be a complex molecule of which the *lethal principle* is a necessary part or that the two substances may be united at times although independent in their action. There is also the possibility that the lethality shown by the residue from dialysis and by the ammonium sulphate precipitate, arises merely from physical adsorption rather than from chemical union.

Many questions present themselves for solution and we hope to be able to extend the work, of which this is but a beginning. It is by no means certain that all tuberculins will behave as have those with which our experiments have been carried out. If, as seems possible, the dialyzable, non-precipitable, lethal material is formed as a result of the hydrolysis of a more complex molecule containing the skin-reacting principle, we may expect to encounter all gradations, from tuberculins which yield no dialyzable, ammonium-sulphate-soluble, lethal material, to those which have all of the lethal material in that form.

It has already been shown that, in the case of our fractions, the lethal power was not an accurate guide to the skin-reacting power for guinea pigs. This does not necessarily mean that, in whole tuberculins, one of these reactions can not be used as a measure of the power to produce the other. Is the lethal principle always present in tuberculin in a fixed relative proportion to the skin-reacting principle? If so, the former may well serve as an index of the latter. At the present time we have not sufficient data in hand to warrant an expression of opinion on that very important question.

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THE AUTO-INHALATION METHOD OF ANESTHESIA IN CANINE SURGERY

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In 1914, McGrath¹ described an apparatus to be used in anesthetizing dogs and certain other animals with ether and chloroform. The induction of anesthesia with this apparatus he called the auto-inhalation method and, with slight modification, it has been employed for nearly fifteen years in the laboratories of experimental surgery and pathology of the Mayo Clinic with utmost satisfaction. A large number of anesthetics are administered each year by one trained anesthetist who readily attends several operating-tables at the same time.

Originally the apparatus consisted essentially of a rubber tracheal tube, attached to the top of an ether-can by means of a three-way metal tube. The tracheal tube was attached to the horizontal limb of the three-way tube; the latter contained an inlet valve and an outlet valve. The lower arm of the tube was inserted in the opening of a can of ether, in the top of which was another small opening to allow a current of air to pass through the ether vapor. In the side of the upright arm of the three-way tube was an opening regulated by a perforated cuff for the admission of extra air. Thus the concentration of the ether vapor passing through the tracheal tube was varied and served as a means of regulating the anesthesia. If the dog was first anesthetized in an ether-chamber (or with a cone), it was possible to pass the rubber tube into the trachea and so continue administering the ether or chloroform vapor efficiently and almost automatically.

In 1920, one of us (Mann)² reported an improved adaptation of the method and apparatus which he had used for several years. The principal changes were substitution of brass tubes of various diameters for the rubber intratracheal tube, and the use of three-way tubes without valves, the advantages of which will be indicated later.

The method has been demonstrated at several veterinary association meetings and clinics and has also been favorably

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commented on by visitors to our laboratories. An increasing number of inquiries concerning the apparatus and method are received each year from laboratory directors and veterinarians. The following description is somewhat more detailed than any previously published and is offered here for the guidance of those who wish to adopt the method.

The animal is first anesthetized in a closed cabinet, then placed on the operating-table, and the anesthesia maintained by attaching an ether-can to the tube inserted in the trachea. For those whose work does not justify the expense of a cabinet, it has been found satisfactory to induce the initial etherization by the cone method.

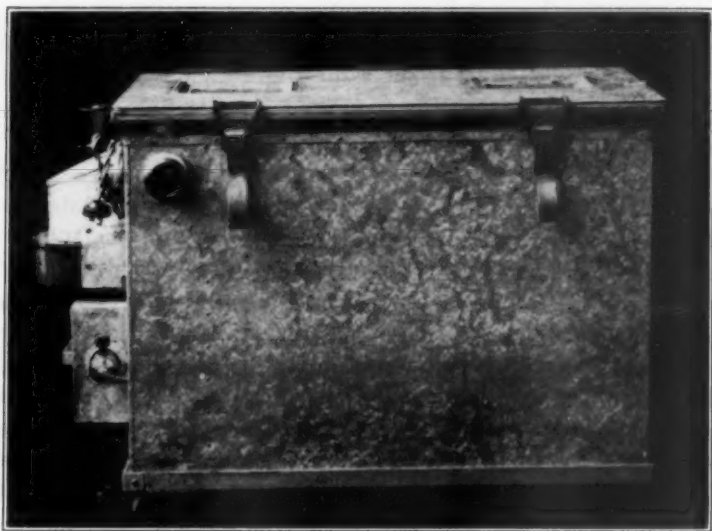


FIG. 1. Front view of etherizing cabinet; method of fastening lid, windows in lid and switch for controlling hot plate.

The pre-anesthetic treatment consists in withdrawal of food for at least twelve hours, which is sufficient so far as the anesthetic is concerned but it is usually better to fast the animal from eighteen to twenty-four hours if operative procedures on the gastrointestinal tract are planned. The animal is given water freely. Atropin and morphin are not given except for special reasons; it is not necessary or advisable to administer the drugs as a routine.

The etherizing cabinet (figures 1, 2 and 3) is a galvanized iron box with a hinged lid, preferably with a copper bottom and a

removable tray in the bottom to facilitate cleaning. A piece of rubber tubing set into the rim makes the lid fit snugly and the box is practically air-tight. The cabinet may vary in size but should be large enough to accommodate the largest dog; the size found most generally useful is 75 by 45 by 50 cm. (28 by 17 by 20 inches), inside dimensions. There are two windows of reinforced glass in the lid and a third window or source of light in one end, to facilitate observation of the animal without opening the cabi-



FIG. 2. End view of cabinet; funnel for introducing ether into ether-pan, hot plate beneath ether-pan and method of lighting interior of cabinet.

net. A funnel leads to an ether-trap or pan, which is open to the interior of the cabinet. An electric hot-plate placed beneath this ether-trap vaporizes the ether quickly and decreases both the amount of ether and the time necessary for the initial etherization. The heating of the plate is controlled by a switch, the cord to which is plugged in on any convenient outlet. Care is

taken to prevent the ether from coming in contact with the hot plate or electrical connections.

A simpler and less expensive cabinet may be constructed with a funnel leading to a sponge within a wire basket attached to the under surface of the lid (figures 4 and 5). Ether is poured through the funnel until it saturates the sponge; the funnel is then closed by a cover or by setting the ether-can on top of it. Material other than galvanized iron, such as reinforced glass, may be used in the construction of the cabinet if desired. In laboratories where a large number of anesthetics are adminis-

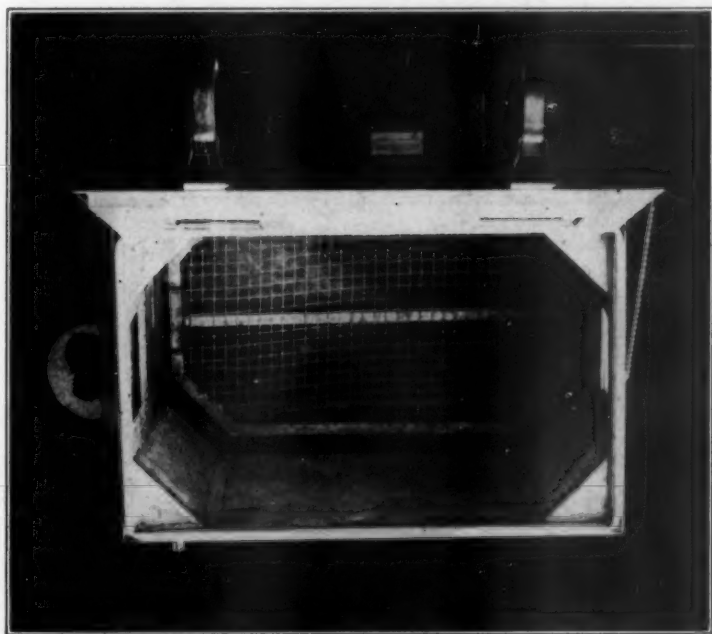


FIG. 3. Top view of cabinet with lid lifted; rubber tubing set into rim and removable pan with grating in bottom of cabinet.

tered, two cabinets may be of advantage, one large and one small.

The time necessary to produce anesthesia with complete relaxation varies with different animals and with the type of cabinet. In the simple type of cabinet, the ether does not vaporize so rapidly as in the one with the heat, and the time consequently is longer. In either case, however, the tension of ether vapor necessary to saturate the blood to the degree which will produce surgical anesthesia is produced rather slowly; the animal, being unrestrained in the cabinet, usually struggles little or not at all

and makes practically no noise. Relaxation occurs in from four to ten minutes. As soon as the animal appears to be completely relaxed, it is placed on the operating-table and intubated and the ether-can connected. If the animal is not sufficiently anesthetized, when placed on the table, to permit of easy intubation, an ether-cone applied over the nose will effect this in about half a minute.

Intubation in the dog is simple, provided three necessary conditions are fully maintained. First, the dog must be anesthetized to full surgical anesthesia to overcome reflexes, especially those

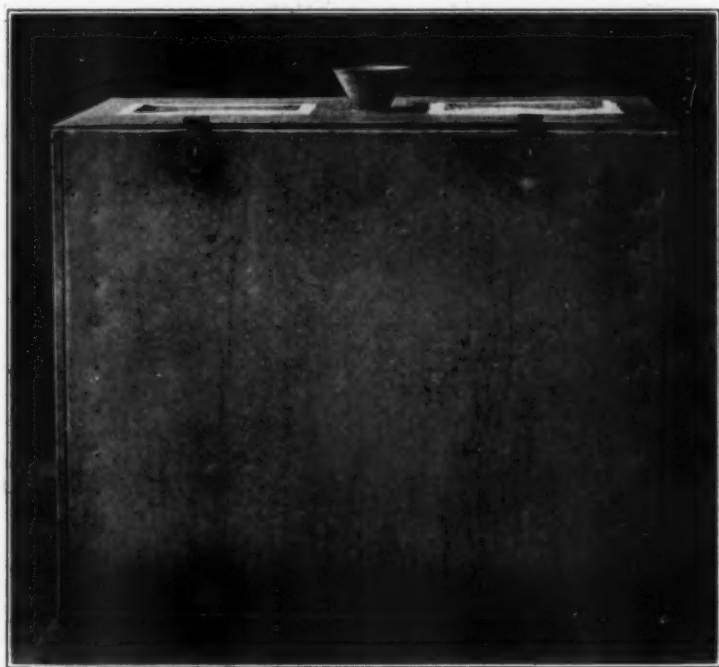


FIG. 4. Simple type of cabinet; two windows in lid and funnel leading to inside sponge-basket.

of the larynx; second, the body must be perfectly straight and the animal on his back (he may be placed on the abdomen after intubation if desired); third, the tongue must be pulled forward in a straight line. The latter procedure throws the glottis in view and the metal tracheal tube can be inserted into the trachea, using the end of the tube to lift the epiglottis slightly if necessary. With this method of auto-inhalation, the diameter of the metal tube should be such that it almost fills the trachea; otherwise too

much air unmixed with ether vapor will be admitted around the tube and the anesthesia will not be properly maintained. The tube should be inserted down to the bifurcation of the trachea and then retracted 3 or 4 cm. and the can of ether attached. The ether can is connected to the three-way tube by means of rubber tubing of any desired length; this connection is flexible and permits the can to be moved about without disturbing the tracheal tube.

The brass tubes required are of varying diameters: 5, 8, 10, 12, 14, 16 and 18 mm. (fig. 6); the larger tubes are all about 38

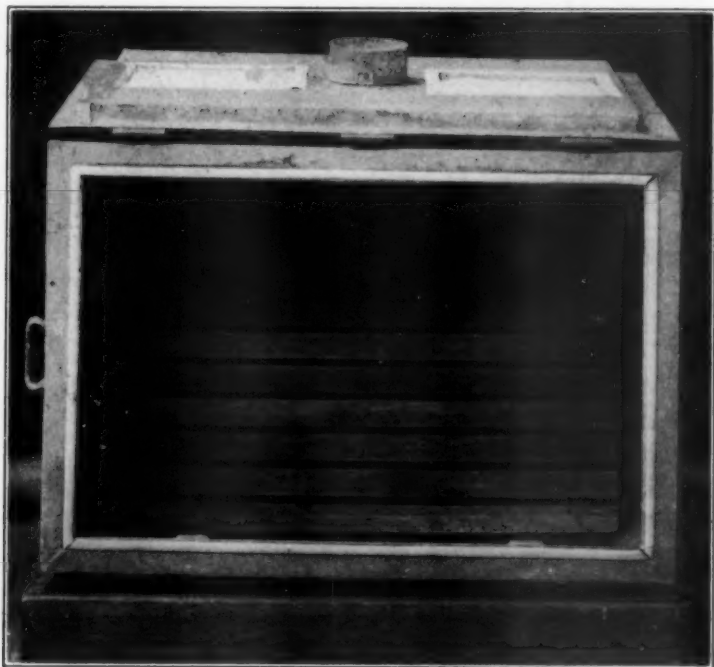


Fig. 5. Cabinet with lid lifted; removable sponge-basket, rubber tubing set into rim of cabinet, and removable grating for bottom of cabinet.

cm. (15 inches) long; the smaller tubes are proportionately shorter. In hospital work they should be sterilized by boiling or they may be kept in a non-corrosive disinfectant solution ready for use. This precaution mitigates against the transfer to healthy animals of infectious material from animals that may be harboring distemper or other infections. If these tracheal tubes are properly used and inserted, tracheitis or mechanical injury will not result from their use.

The ether-can may be simple or complex but the simplest kind has proved best. It is made from a one-pound ether-container, in which two small, straight metal tubes are soldered in the top. The diameter of these tubes is 7 mm. To one of these is attached a T-tube or three-way tube, as shown in figure 6, connected by rubber tubing to the intubation tube. A sleeve valve or perforated rubber or metal cuff on either the horizontal or upright arm, or both, of the T-tube, allows the entrance of air which does not contain either vapor. These valves, by being opened to varying degrees, vary the concentration of ether vapor being inspired and so regulate the anesthesia. A small piece of paper is pasted to the other upright tube in the can and acts as an indicator of respiration. This is not essential but desirable when the animal is more or less completely covered with sterile

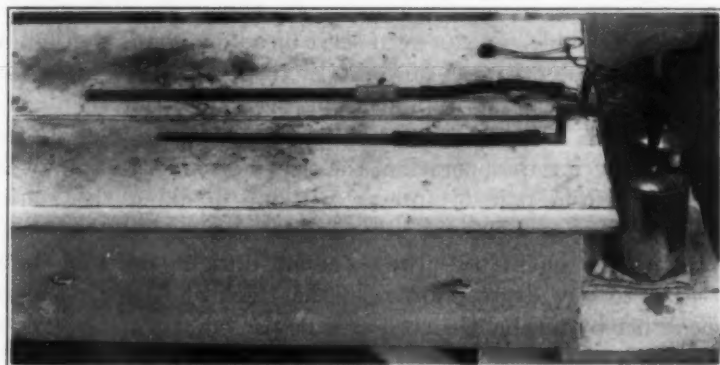


Fig. 6. Inhalation apparatus with two sizes of intratracheal tubes.

operating-cloths and towels, and it also enables the anesthetist to observe the rate of respiration at some distance from the operating table. The animal breathes the air which, passing over the ether, takes on a considerable amount of the anesthetic. The anesthesia when once regulated can be maintained for minutes or hours with very little attention either from the anesthetist or the operator. If it is necessary to replenish the ether in the can during a long operation, the T-tube is detached from the can, a funnel inserted and as much ether as desired poured in.

ADVANTAGES AND DISADVANTAGES OF THE CLOSED-CABINET METHOD OF INDUCING ETHER ANESTHESIA

The closed-cabinet method has many advantages and some disadvantages. By starting the anesthesia in a cabinet, the

animal goes under slowly, with just enough anesthetic tension to produce anesthesia. Thus, the initial administration, which is ordinarily the most dangerous part of the procedure, is relatively safe. The animals rarely become over-etherized in the cabinet. Furthermore, the average animal passes into a state of anesthesia with the minimal amount of struggling and without relaxation of the bladder or anal sphincters. Since the cabinet is almost air-tight and large, there is a limited amount of rebreathing during the period of initial etherization when rebreathing is probably of greatest value. The procedure requires only one anesthetist who may render other assistance while the animal is slowly reaching the anesthetized state. To the veterinarian who does not always have a trained assistant at hand to administer anesthetics, or in small-animal hospitals in which sufficient personnel is not always available for operations, the method should be extremely valuable. It can even serve as a "one-man" method in emergencies, the operator first anesthetizing and intubating the subject, then scrubbing up and preparing himself for the operative procedure. If the operator finds it necessary to regulate the anesthetic during the operation, the sleeve or cuff valves may be adjusted with a pair of forceps without breaking the sterile technic. By suspending the ether-can in a swing from the operating table so that it will always remain upright, the table may be tilted to any degree, provided the tracheal tube is held in place either by means of a cord or tape passed about the jaws of the animal, so that the incisor teeth are closed on the tube.

Another advantage of the method is that the air-passages are not obstructed; the mouth, nasal passages and eyes are not subjected to the irritating effects of the ether as with the cone method and the eyes and mucous membranes of the mouth remain uncovered, so that the corneal reflex may be conveniently watched in the former and the state of circulation easily ascertained by the latter. Moreover, if for any reason artificial respiration should become desirable, the tracheal tube is left in place but is detached from the ether-cone, and the tube then furnishes an unobstructable passageway for air; neither the tongue nor mucus can clog the larynx or trachea.

Some of the possible disadvantages in this method are that it may possibly require more ether than the old-fashioned cone-method, and that it may take somewhat longer for the animal to become anesthetized. The first objection is more than offset by the almost, perfectly satisfactory anesthesia that results with

only occasional attention from an assistant or the operator. The latter disadvantage need be of no consequence in loss of time, since the anesthetist or operator may be doing other work while the animal is undergoing initial etherization; moreover, the usual struggle with its attendant noise is no longer a part of the preliminary anesthesia.

The simple ether-can method requires a slightly larger amount of ether than some or the other methods because the animal, in breathing back through the can blows out the same proportional amount of ether vapor as is drawn in on inspiration. This can be obviated by the use of two one-way valves in the T-tube attachment as mentioned in connection with the McGrath apparatus. In our experience, however, the additional respiratory effort necessary to operate these valves and the increasing complexity of the apparatus, have seemingly more than offset the advantages of their use. In other words, the most satisfactory results depend on keeping the apparatus as simple as possible.

In this description, the use of ether as the anesthetic of choice has been implied, although chloroform may be administered with the same method and apparatus. It is felt that too many disadvantages are attached to the use of chloroform as a routine measure, although we know that it is regularly employed by certain investigators with apparently good results. Chloroform anesthesia must be watched much more closely than ether and in the hands of those not skilled in its use, the postanesthetic action will result fatally in a considerable number of cases. Moreover, prolonged chloroform anesthesia has a definite damaging effect on the parenchyma of the liver and may cause marked necrosis and fatty changes in that organ. Under certain conditions, however, when a short quick anesthetic is desired, chloroform may be used by those skilled in its administration.

In general, the advantages of the cabinet inhalation method are many. An even anesthesia may be maintained over a long period if necessary; the anesthetist or assistant, after intubation of the subject, can devote most of his time to other duties or to assisting with the operation; it furnishes a perfectly feasible one-man method that can be employed by the practitioner or in emergencies; and the animal is easily kept under light anesthesia from which it comes out quickly after the operative procedure has been carried out.

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THE GROWING IMPORTANCE OF THE VETERINARY PROFESSION*

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*President, University of Maryland, and Executive Officer of
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First I want to call special attention to three words in my subject—profession, importance and growing. Your vocation is a profession. It requires educational preparation equivalent to that required for other professions and much more than was required for the medical profession when many physicians now active and successful were receiving their education.

Your vocation is not only learned but it is dignified. In dignity and public esteem and respect it compares well with others, depending in any section upon the knowledge that the people of that section have concerning the work of the veterinarian and depending equally upon his personality and his public contacts. The same may be said of every profession. They are all judged largely in any given section of the country by the character of the individuals who serve in that section. The newest or the smallest profession may be under something of a handicap in this respect, but a handicap fortunately that can be overcome.

The veterinary profession ranks high as to its importance. It is necessary for a successful live stock industry; and that is essential to successful agriculture. And that is vital for a prosperous nation. The veterinary profession, therefore, is one of the corner-stones underlying national prosperity.

The veterinary profession also is necessary to assure wholesome animal food-products, especially milk and meat. And a wholesome food supply is vital to public health. The veterinary profession, therefore, is one of the few big factors responsible for national health and vigor.

It would be interesting to know what, and how much, veterinarians are doing outside of their profession for the public welfare and it would be equally interesting to know how far-reaching have been the developments in the field of veterinary research. Occasionally a veterinarian makes a creditable record in politics and often one is found as an outstanding leader in constructive

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citizenship. In all these respects, veterinarians compare well with other groups of professional and non-professional people.

Probably not one person in 100,000 who use the Panama Canal, or benefit from it, knows that research in the veterinary field made the canal possible. A monument should be erected on the side of the Panama Canal to tell the world—in all the years to come—how the construction of the canal depended upon the control of yellow fever and how that secret was revealed by the work of Smith and Kilborne, under the direction of Salmon, who was chief of the U. S. Bureau of Animal Industry.

But the word in the title of this paper to which I would give chief emphasis is the word *growing*. Things that are growing are most apt to attract attention. So many things in the United States are growing that the veterinary profession is not getting the attention it deserves. It is not growing in numbers. In this way it is going backward. But its importance is growing and it should grow in numbers. Two things are chiefly responsible for the present situation. In the first place many veterinarians are discouraged because their work has suffered somewhat from the agricultural depression. In the second place very many laymen have thoughtlessly yet naturally reached the conclusion that horses and mules are going out of use, or nearly so, because automobiles and motor trucks are increasing so fast. And they think that with this change the need for veterinarians is disappearing.

When many within a profession are discouraged and very many out of it misjudge it, small wonder that the annual additions to the ranks do not equal the annual losses.

This is a situation that calls for serious attention. Shall we care for it or shall we let it run along as it is until a catastrophe comes and then take our punishment and our losses and then perhaps mend our ways? We are now headed for a catastrophe that will be comparable with the Mississippi flood. The appearance of a highly contagious disease of live stock and its uncontrollable spread would result in terrible losses.

There are many young men of college age who have a liking for animals, and who should prepare for the veterinary profession, but are turning away from it. The best of these should be helped to see the true picture—the present situation and something of the future outlook. When they see it, more of them will want to enter the profession. The nation needs them and good compensation awaits them.

These young men—these potential veterinarians—and their advisors should know that:

1. Agriculture will “come back.” Already there are improvements in some sections. This great fundamental industry has suffered from two shocks: the war, which hurt every peacetime industry, and certain important readjustments which had to come within the industry. There are reasons to believe that a long period of agricultural prosperity is coming.

2. The value of live stock is increasing enormously. This is partly due to the increase of pure-bred and high-value animals. The value of live stock on farms in the United States

In 1900 was nearly three billion dollars.

In 1910 it was nearly five billion dollars.

In 1920 it was nearly eight billion dollars.

In 1926 it was approximately five billion dollars.

The value in 1926, after suffering a heavy cut in harmony with the general agricultural situation, was about sixty-six per cent larger than in 1900. The next census probably will show another large increase in these values.

3. There is no such decrease in the number of horses as is generally supposed. We do not see as many horses on the highways as formerly. But on the farms of the United States there were more horses in 1910 than in 1900, when the automobile industry was starting. In 1910, 187,000 passenger cars and motor trucks were produced in this country. In 1920 this production had increased to 2,205,000. And in 1920 there were more horses on farms in the United States than in 1910 and in this same period of ten years the mules increased by thirty per cent. In 1925 the number of passenger cars and motor trucks produced was 4,158,000. (In 1899 the total production was less than 4000.) In 1900 the total number of horses and mules on farms of the United States was 21,532,000. In 1925 this number had increased to 22,312,000 (16,554,000 horses and 5,758,000 mules), an increase of over three per cent.

4. The numbers and values of other kinds of live stock further indicate the immense field of operation for the veterinarian. In 1926 there were on farms of the United States:

22,290,000 milch cows valued at.....	\$1,279,000,000
37,539,000 other cattle valued at.....	1,018,000,000
40,748,000 sheep valued at.....	427,000,000
51,223,000 swine valued at.....	779,000,000

The poultry industry is much larger than is generally known. The annual production of chickens and hens' eggs is valued at about one billion dollars.

To these stupendous values we should add another large item for small animals, including millions of pet animals.

5. The protection of this great array of animals against disease and the treatment of disease when it appears is the big job of the veterinarian. Thus his work underlies success in farming and has an important relation to national prosperity. To the credit of the profession be it said that the veterinarians of the country, ably led by the Bureau of Animal Industry, have totally eradicated different highly contagious diseases of animals that have appeared from time to time. In every instance, where they have been given full control, they have been 100 per cent successful. Contagious pleuro-pneumonia and foot-and-mouth disease have appeared a number of times and always they have been conquered. Probably the same will be said of hog cholera and rabies when the veterinarians are given exclusive control. Because of their work, glanders is a curiosity, dourine is a memory, the Texas-cattle-fever area is being constantly decreased, scabies is under control and lip-and-mouth ulceration is no longer a menace to the sheep-raiser. "Hollow-horn" and "wolf in the tail" were about the first to go with the approach of the scientifically trained expert.

The eradication of bovine tuberculosis is making good progress. This work is thoroughly understood. The area plan is proved to be the logical plan. The limiting factor is funds and these are being provided more and more liberally by federal and state governments. The annual expenditure is now about \$20,000,000.

The treatment of individual cases will always constitute an important service. Calls for such service increase in number as the quality of live stock is improved and the money value of the individual increases. Some practitioners are developing specialties, as is done by physicians. Even the diseases of poultry offer attractive opportunities.

6. The federal government, states and many municipalities are employing many veterinarians in responsible positions in connection with meat inspection, milk inspection and sanitary inspection. The staff of the Bureau of Animal Industry includes 1360 veterinarians. Hundreds of others are serving as state, assistant state and municipal veterinarians. The growing importance of meat inspection is realized when we remember that

about 115,000,000 animals are slaughtered in this country annually and the average man, woman and child consumes about 150 pounds of meat annually. Private concerns also employ many veterinarians because full-time service is needed.

7. While the veterinarian always will be trained to cope with disease and to prevent disease, he should expect to cooperate more and more with the owner of live stock in developing better types of animals. With his knowledge of the laws of animal life he will be able to assist in breeding, feeding, management and shipping. He will help to produce greater vitality, better productivity, while at the same time he shows how to avoid losses from disease. One veterinarian of my acquaintance who has accepted this broad conception has been appreciated more and more until now he is regarded as a great benefactor in his state and he is honored accordingly.

8. The field of veterinary research has not been mentioned, but it is one of the most important and interesting of all the opportunities. The Bureau of Animal Industry and several states are well equipped for research and are producing results that are increasing our stock of scientific knowledge and that apply to problems in the fields of veterinary medicine and public health and far beyond.

9. All these facts show the need for veterinarians, yet it is a fact that there is a heavy decrease in the number of students in our veterinary colleges.

In 1924 there were about 12,000 veterinarians in the United States and Canada. This number decreases by about 600 per year by reason of deaths and withdrawals. New veterinarians are being graduated at the rate of about 150 per year from the standard veterinary institutions of the United States and Canada. Until about eight years ago the number of graduates was substantially equal to the annual decrease. The shortage that is developing is now felt in many places. Large areas in our most important stock-raising sections are without veterinary service. Attractive positions are not filled because of shortage of candidates.

The time has come for the recognition of the growing importance of the veterinary profession. Those in high positions should give this recognition. They must do so if they are informed of the facts. Especially those in the profession should give recognition because they know the facts, and all concerned should bring these facts to the attention of those young men who would be a credit to the veterinary profession.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

A COMPLICATED CASE OF PROLAPSED RECTUM

By W. F. GUARD, Ames, Iowa

Department of Veterinary Surgery, Division of Veterinary Medicine, Iowa State College

Patient: Holstein cow, 3 years old (case 1712).

History: The morning of December 8, 1925, the animal was observed to be bleeding from the rectum and that same evening a section (about four inches) of the rectum was noticed protruding. The following day, December 9, the animal was presented at the clinic.

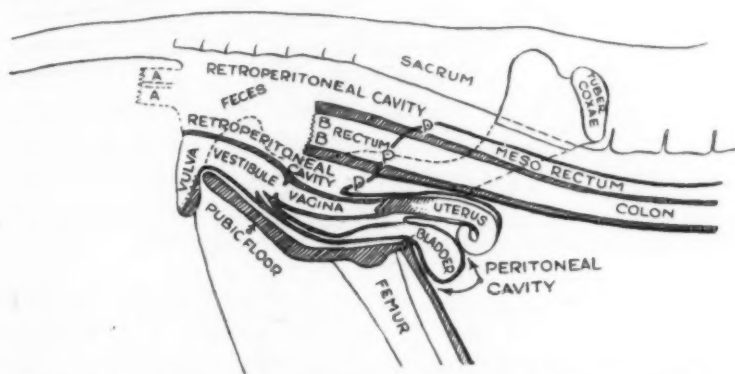


FIG. 1. Prolapsed rectum. A-A, portion of rectum prolapsed; B-B, portion of rectum retracted; P-P-P, line of peritoneal reflection

Symptoms: Pulse, 75; respirations, 20; temperature, 101° F. The general condition of the animal was good. The protruding portion of the rectum was badly lacerated. Close inspection revealed the fact that the rectum had been completely severed, as is shown in figure 1 (A-A). The last four inches of the rectum remained intact and was prolapsed, as shown in figure 1 (A-A). The anterior portion of the rectum had retracted forward about twelve inches (figure 1, B-B). The retroperitoneal space, between A-A and B-B, dorsal to the vulva and vestibule, was impacted with feces and the loose connective tissue in this region was badly contaminated.

Treatment: The feces were quite thoroughly removed and the cavity was washed, but it was impossible to remove all of the contaminated loose connective tissue. The animal was given one and one-half ounces of chloral hydrate in warm water by stomach-tube and was then confined to the operating-table. An incision about four inches in length was made in the roof of the vestibule, as represented in figure 2 (x-x). The protruding portion of the rectum (A-A) was then removed and the end of the rectum (B-B) grasped with forceps and pulled backward to the anus, as shown in figure 2 (A-A). The severed end of the rectum

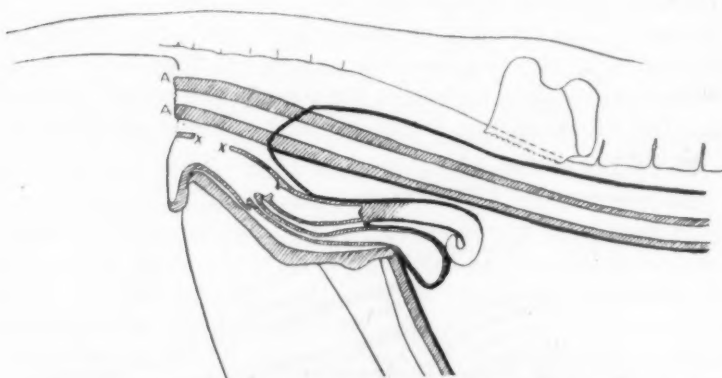


FIG. 2. Operative procedure. X-X, incision in vestibule; A-A, severed end of rectum pulled back to anus and sutured to skin and perianal tissue.

was then anchored to the skin and perianal tissue by eight mattress stitches of No. 4 pyoktanin catgut. Interrupted sutures were placed between the mattress stitches. Good drainage was obtained through the incision (figure 2, x-x). The animal was taken to her stall and, on account of a tendency to strain, was completely anesthetized with chloroform.

The animal was in the hospital 22 days and during that time the vagina was flushed daily with warm mild antiseptic solutions. The edges of the drainage opening (figure 2, x-x) were greased with carbolyzed petrolatum. The animal made daily improvement, but on the eighth day a small recto-vaginal fistula was found to exist. It was not thought advisable to attempt repair work at that time. The animal was sent home on the twenty-second day and the owner advised to bring her back later for the final repair work. This he did not do, but later reported that she got along fine until she received some internal injury, due to

slipping and falling on a concrete floor, and he decided to dispose of her for emergency slaughter.

ACKNOWLEDGMENT

Dr. W. A. Aitken, of the Department of Veterinary Anatomy, made the drawings that are used to illustrate this case report.

Meet thy friends in the Friendly City— Philadelphia, September 13-14-15-16

CESAREAN OPERATION IN A COW TEN MONTHS AFTER CONCEIVING

By WM. M. BELL, Nashville, Tenn.

On February 9, 1927, I was called to one of our best Jersey herds to see a cow. The history was that she had been bred, April 30, 1926. She had never been in heat since she was bred and was now ten days past due. The cow had no appearance of being in calf. The udder and vulva were those of a cow not in calf. She was an imported Jersey, of high class, had cost her present owner \$1,500, was fat and had had several calves.

I made an examination through the rectum. I could not pick up the left horn of the uterus and could not palpate either ovary. Examination through the vagina did not help.

I advised an operation through the flank, as it was my opinion there was a fetus in the uterus or possibly we were dealing with a case of extra-uterine pregnancy. The owner decided we would operate later, when the weather was more suitable. On February 25, he called and said he thought it would be a fine day to operate. As I had the time, I went out as soon as I could get ready.

We stood the cow with her left side against a fence, tied her head to a fence-post and brought a rope under her neck along her side and tied it to the fence behind her, drawing it taut enough to hold her from moving much, and to keep her in a standing position. After washing and shaving in front of the ilium and well down, we painted the operative area with tincture of iodine and injected a solution of cocaine over the field of operation.

The opening was made seven or eight inches long. I passed my hand in, and found the uterus was hard to recognize and palpate, but after some time, I picked up the right ovary and right horn. I followed it to the bifurcation and followed the left horn downward and forward. Then I had to change hands.

It took the full length of my left arm, downward and forward under the rumen. In the left horn was a calf. I removed my arm and cut the opening about three inches longer in the downward direction. Then, after some work, I succeeded in bringing the fetus to the opening and partly outside, where my assistant, Dr. E. E. Nisbett, opened the uterus, while I, with a milking motion, forced the fetus out. It was about as large as a cat, with a head about as large as a walnut with the hull on. I milked out about a washpanful of sterile pus. The opening in the uterus was about five inches long. After putting about two ounces of flavisol into the uterus, Dr. Nisbett closed the opening with catgut, while I held it outside. We then closed the abdominal peritoneum with catgut and the external opening with linen and covered with vaselin.

Four days later, there was a discharge from the vagina, but no pus or swelling about the wound. We saw her again on March 5, or eight days after the operation. She looked fine. On March 15, or eighteen days after the operation, we removed the sutures and examined the discharge from the vagina and found it clear. We examined the uterus through the rectum and it appeared to be almost normal in size. She took the bull, May 10 (27 days ago) and has not been in since. I can see no reason why she will not breed.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***

UNUSUAL PHYSICAL PROPERTIES OF MUSCLE FAT IN YOUNG BEEF

By H. E. BIESTER and CHAS MURRAY, Ames, Iowa

Department of Veterinary Investigation, Iowa State College

On July 1, 1926, two cuts of beef, about 10 by 15 inches and about one-half inch thick, taken from the loin region, were submitted to this laboratory for examination. This meat in the form of steaks presented a repulsive appearance. The surface was excessively marbled and blotched by a grayish-white, cellular-appearing material, very much unlike the clean white or yellow appearance of fat in well-marbled, normal beef. In many places this gray-colored tissue exceeded the normal muscle. The first glimpse at the specimen suggested a tumor invasion or

connective tissue proliferation. The gray tissue in the muscle was firm and tough. On pressure it presented about the same firmness as the muscle itself, and in appearance and texture showed no resemblance to fat tissue.

The representative submitting the specimen stated that this condition had been of frequent occurrence during the summer. The back muscles and hind legs were usually involved and it occurred only in young beeves well fleshed and fattened. Due

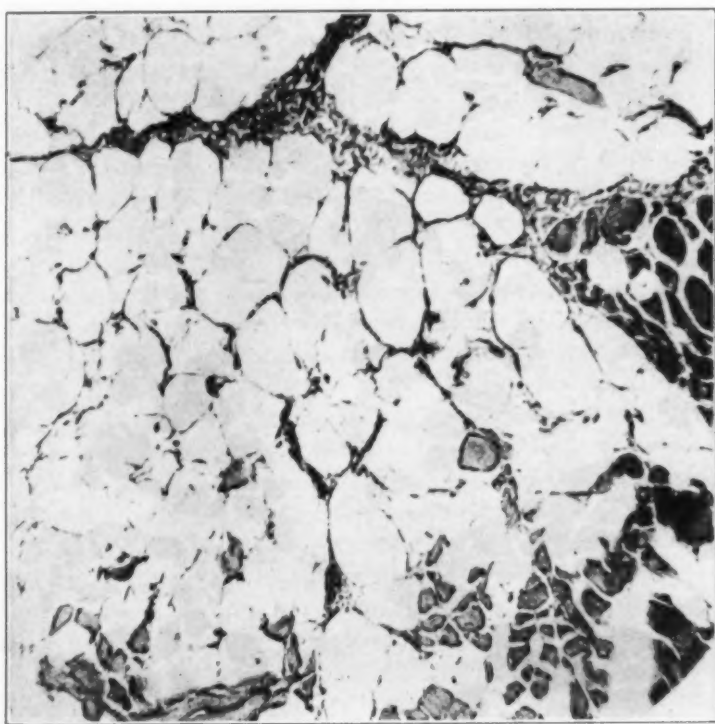


FIG. 1. Showing parts of three primary bundles with advanced fat infiltration. $\times 150$.

to the repulsive appearance of the meat, it became necessary to dispose of carcasses so affected at a heavy loss. It was further stated that when such meat, showing large patches and marbling by this gray tissue, was being fried, the entire surface turned a red color indistinguishable from muscle tissue. This took place very shortly after being placed in the frying-pan, long before the usual browning of meat takes place. We repeated this test in the laboratory and our results confirmed the foregoing

statements. The partly fried meat presented a delicious appearance and could be cut with the greatest ease.

Specimens were then taken for fixation and subsequent microscopic study. The fixative used consisted of a four per cent formaldehyde solution in .85 per cent saline. When cubes of this meat, composed chiefly of this firm gray tissue, were dropped into the above-described fixative, much to our surprise they floated. Others composed of a larger proportion of normal

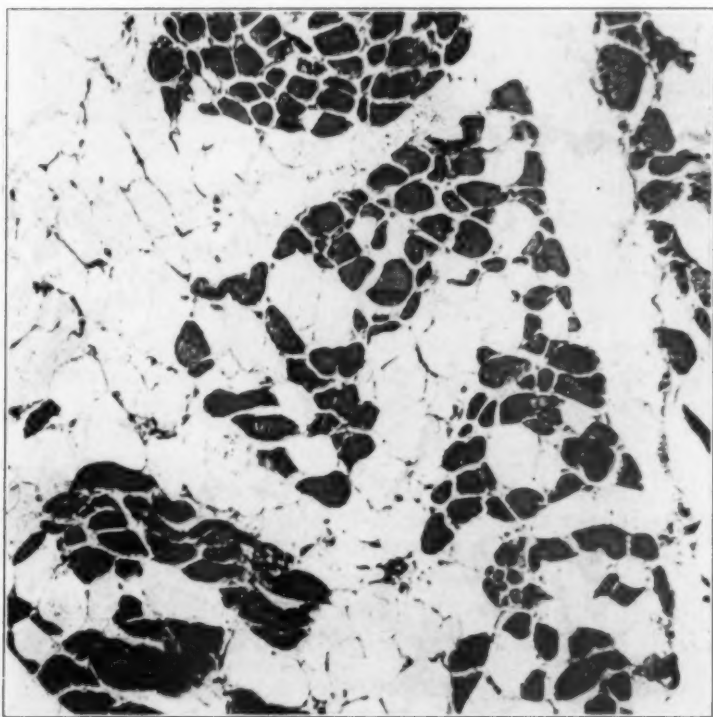


FIG. 2. Showing involvement of individual muscle fibers and larger groups. $\times 150$.

muscle fibers sank slowly, while some came partly towards the surface before settling to the bottom.

Microscopic examination of preparations stained with hematoxylin and eosin, demonstrated this gray portion to consist of fat. The fat had infiltrated the muscle fibers as well as the interstitial tissue. Field after field showed complete fat infiltration with obliteration of the muscle fibers in entire primary bundles and often almost complete involvement of secondary

bundles (fig. 1). At other times varying numbers of individual or groups of muscle fibers in the primary or secondary bundles were given over to fat infiltration (fig. 2).

The extreme tenderness, after short frying, and the property of specimens of floating in a normal saline-formaldehyde solution is in accord with the microscopic findings but in contrast to its abnormal gross appearance.

After microscopic diagnosis was made, it unfortunately became impossible to elicit response to further inquiries regarding the origin of these animals, details of feeding or to procure further specimens for chemical and microchemical examination. A search of the available literature has not revealed a description of a process of like nature.

It is a well-known fact that the chemical composition and physical properties of the body fat are governed by the composition of the feed consumed. This is brought out very pointedly in the soft-pork studies of Ellis et al.^{1,2} Fat ingested by an animal is deposited in the body retaining much of its original composition. Thus, animals fed soft fats (which are high in unsaturated fatty acids) will show a body fat of low melting-point. Body fat synthesized from feed containing very little or no fat will be firm and of a higher melting-point. However, the body selects the ingested fat in preference to synthesizing fat from the carbohydrate elements when the former is available in excess. As a general premise it can be stated that the composition of the body fat is dependent upon the kind of ration fed.

The physical properties of fat might be governed by the temperature of that part of the body in which it is deposited. V. Henriques and Hansen have shown that in the part of the body where the temperature is higher, further from the surface, the fat shows a lower iodine value, i. e., less unsaturated fatty acids, which means a fat of higher melting-point.¹⁰ The perirenal fat is generally harder than the fat of the back or that nearer the surface. All workers except one are in accord with these general statements. Harrington and Adriance⁴ contend that the iodine value rises with increase in the melting-point. These findings are not compatible with the results of other investigators. The iodine value depends upon the amount of unsaturated fatty acids present, while the hardness of fat is governed by decreased amount of unsaturated acids.

The growing bovine and pig show diametrically opposite fat characteristics with reference to the melting-point. The young

pig fed on a normal ration shows a gradual increase in the melting-point of its fat as it matures. In the young beef animal the reverse condition prevails, i. e., the melting-point falls as the animal matures and the amount of body fat increases.⁸

In view of our inability to elicit further information regarding the history of the herds and methods of feeding, or to obtain material for several autopsies, it becomes impossible to arrive at definite conclusions. In view of the pronounced changes in a number of animals, some definite factor or factors operate to produce these deviations. The possibility of an extreme ration resulting in the formation of fat possessing the qualities described has suggested itself.

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Thee and thine to the City of Penn; Forget not when—September 13-14-15-16

SOME CASES OF INTEREST*

By M. F. BARNES and A. L. BRUECKNER

*Pennsylvania Bureau of Animal Industry
Harrisburg, Pennsylvania*

Among the specimens received at a diagnostic laboratory, there are certain specimens which are of particular interest because of the diseases represented and because of the existence of these diseases in unusual districts, or because of their confusion with other well-known diseases. The cases reported herein are recorded because they apparently are more or less rare in occurrence or can readily be held accountable for mistaken diagnoses.

RED DYSENTERY (COCCIDIOSIS) IN CALVES

During the month of October, 1924, the attention of the writers was called to a dysentery in calves on a farm near

*Read before the Pennsylvania State Veterinary Medical Association, Harrisburg, Pa., January 19, 1927, and the Keystone Veterinary Medical Association, Philadelphia, Pa., March 23, 1927.

Philadelphia. This lot of calves consisted of thirty, ranging in age from ten days to two months. Several of the calves showed a severe diarrhea and the feces contained blood intermixed with mucus. In well-marked cases the feces had the appearance of almost pure blood. The calves were seen humped up and showed severe straining in attempts to defecate and at such attempts passed only a small amount of bloody mucus. In these severe cases the temperatures were elevated to 103 to 103.5° F. The less-marked cases showed no noticeable temperature elevation and tenesmus was not noticeable.

Of the thirty calves in the group, sixteen developed noticeable clinical symptoms, and coccidia (B. A. I. 16166, 16175, 16178 and 16207) were demonstrated in the feces. In all but one case in which coccidia (*Coccidium zurni*) were demonstrated in the feces by microscopic examination, blood could be demonstrated in the feces. Of the sixteen affected calves, five (33⅓ per cent) showed severe symptoms and one of the five died. The prognosis of the other four did not seem favorable. Of those which showed severe symptoms and recovered, the length of time between the first manifestation and the height of severity was four to six days. The length of time from the height of the disease to apparent complete recovery was five to six days. The course of the disease was ten to twelve days. Coccidia were plentiful in well-marked clinical cases and less plentiful where clinical symptoms were less pronounced.

No medical treatment was attempted in these cases, but strict sanitary measures were followed, with the result that there have been no other cases on this farm. In carrying out the sanitary measures, calves showing clinical symptoms were placed in a pen by themselves and all pens were thoroughly cleaned and fresh bedding supplied daily.

STOMACH WORMS IN CALVES

Interesting cases (B. A. I. 16256), wherein stomach worms were the cause of severe diarrhea, emaciation and death of several yearling heifers, came to the attention of the writers in November, 1924. These deaths occurred on a farm near Philadelphia, or in a vicinity where, so far as is apparently known, infestation of cattle to any damaging extent with stomach worms is unusual. At the time of the first observation, three heifers out of a group of approximately fifteen had died on pasture after having shown a profuse diarrhea. Poisoning,

Johne's disease, and other conditions which would cause diarrhea were suspected. Microscopic studies were made to eliminate Johne's disease. Examination of intestinal contents and organs by the state chemist revealed no evidence of the usual chemical poisons. The stomach and intestinal contents were found to contain numerous stomach worms which were identified by the parasitologist (Crawley) as *Ostertagia ostertagi*. The foundation stock of the herd from which these specimens were obtained came from one of the southern states.

Since the time of this first observation, some trouble of the nature described has occurred on this farm each year, during late summer and fall, in young cattle ranging from five or six months to one year of age. During the last season the copper sulphate treatment, as used in lambs, was employed and the veterinarian in charge reported an early response to the treatment, as indicated by an improved condition in the treated calves.

HEMORRHAGIC SEPTICEMIA

Organisms belonging to the hemorrhagic septicemia group are attributed the cause of disease and death in various animals, both domesticated and wild. The isolation, during certain seasons, of organisms of this group from specimens of dead animals and organisms which prove pathogenic upon injection into rabbits is of rather frequent occurrence.

In one case (B. A. I. 16152) the organs of a fox which had died on a fox-ranch yielded an organism of this class which was particularly pathogenic for rabbits and which also produced death in a dog in twenty-four hours after intravenous injection.

Upon laboratory investigation of specimens (B. A. I. 18034 and others) from several wild deer which had died on one of the game preserves, an organism of this group was recovered. The disease at the time caused the death of quite a large number of deer on this preserve but apparently cleared up later through the operation of natural agencies.

At the Zoological Gardens, in Philadelphia, the sudden death of a zebra (B. A. I. 18131) caused considerable concern since anthrax was suspected. Dr. Herbert Fox furnished materials which upon examination revealed as the most marked lesion a serosanguineous infiltration of the tissue covering the aorta. Appropriate laboratory procedure incriminated an organism of

the hemorrhagic septicemia group as the causative agent and eliminated anthrax.

It is of interest to note that in neither case (fox or zebra) were any further cases reported and yet in both instances the rather strict isolation of the individuals and the application of sanitary measures would probably account for this sudden culmination of the trouble.

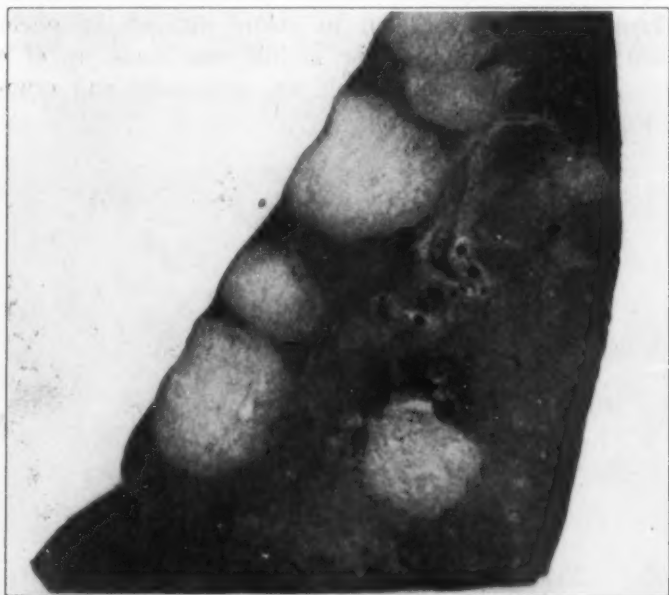


FIG. 1. Section of liver (B. A. I. 16045) showing multiple necrotic areas caused by *Actinomyces necrophorus*.

MULTIPLE FOCAL NECROSIS OF THE LIVER IN CATTLE— ACTINOMYCES NECROPHORUS

During the latter part of 1924 and the early part of 1925, several specimens of this disease were received at the laboratory of the Pennsylvania Bureau of Animal Industry for diagnosis. In each case there was doubt as to the condition present and some suspicion of tuberculosis being the cause.

On September 13, 1924, Dr. M. J. Chrisman, of Warren, Pa., wrote the following letter to the laboratory:

Am sending specimen of the liver of a cow which died on the Mr. _____ farm at _____. The liver was fully 3 times larger than normal and the cheesy areas or spots all over outside and through the organ, no part of it exempt. All through the organ were dozens of them averaging about the size of a silver half-dollar. I cut off about 2 inches

in thickness on the outside portion I am sending you so you can imagine something of the thickness of the liver. This herd is supposed to be free from tuberculosis but this scared me, although deposits did not seem calcareous. It has not been my lot to see one like it before. The cow died Sunday morning and my attention was not called to it until today which is Tuesday. I am sorry to send specimen in this condition but hope you can give us some light on the trouble. Kindly let me hear from you.

The liver (B. A. I. 16045) was received at the laboratory and revealed many hazelnut- to walnut-sized nodules scattered throughout the congested tissue. The nodules were round in form, light yellow-brown in color, without an enclosing capsule and the center of the nodule was made up of completely necrosed material which was semi-solid and crumbly. (See figure 1.)



FIG. 2. Section of liver (B. A. I. 16215) showing areas of focal necrosis caused by *Actinomyces necrophorus*. The liver tissue in this case is somewhat bleached, due to the action of a preservative.

Smears were prepared from the material at the center and periphery of the nodule and stained with methylene blue. The smears from the center presented only necrosed material without any definite microorganisms. Those from the periphery revealed broken-down liver cells and numerous filamentous banded, straight or curved bacilli typical of *Actinomyces necrophorus*. Acid-fast staining was carried out on several smears but no acid-fast microorganisms were found.

Two guinea pigs and four rabbits were injected subcutaneously with an emulsion prepared from the nodules and the peripheral zone. In the case of the guinea pigs death occurred in twenty-four hours, with a decided necrosis of the subcutaneous tissue and the abdominal muscles. Two of the rabbits died within forty-eight hours with lesions as shown in the guinea pigs. Two other rabbits died after five days, each showing a localized lesion at the site of inoculation, which was made up of necrosed material and spreading necrosis along the abdomen. Smears prepared from this region and stained as above revealed a



Fig. 3. B. A. I. 14536. Bull 37. Section through greatly enlarged right testicle and scrotum showing orchitis, periorchitis, epididymitis and thickening of spermatic cord. Cavity surrounding the testicle proper contained $1\frac{1}{2}$ pints of pus, from which a pure culture of the Bang bacillus was isolated. This bull reacted to the agglutination test in all dilutions up to 1-3300. The abscess cavity was between the testicle proper and the tunica albuginea. The photograph to the right shows the roughened surface of the testicle proper, the tunica albuginea having been pushed away and adhered to the parietal tunic.

microorganism identical with that found in the original material.

Sectons prepared from the nodules and stained with eosin and methylene blue revealed the central area of completely necrosed material, a surrounding zone of active inflammation composed of liver cells undergoing degeneration, slight connective tissue proliferation with numerous interlacing, filamentous

microorganisms, typical of *Actinomyces necrophorus*, and an outer zone of round-cell infiltration and hemorrhage.

On November 5, 1924, a specimen of liver (B. A. I. 16215) was received from Dr. D. R. Kohler, of Boyertown, Pa., with a request for diagnosis to eliminate tuberculosis. This material was handled as above for diagnostic purposes and was found to be a similar condition. (See figure 2.)

On April 7, 1925, Dr. Sherman Ames, of Easton, Pa., forwarded a specimen of liver (B. A. I. 16952) to the laboratory from a cow which he had treated for diarrhea but which had died. This cow



FIG. 4. B. A. I. 19928. Left and right testicles, sectioned, from a bull, 15 years of age, which had been a known reactor to the abortion blood-test for a period of ten years. These testicles showed no noticeable enlargement and no adhesions of the tunica vaginalis. The left testicle showed numerous encapsulated abscesses, while the right showed complete replacement of testicular tissue by circular fibrous areas which were probably preceded by numerous abscesses.

had shown a severe diarrhea about a year previous, from which she had recovered. The recurrence of diarrhea proved fatal in spite of treatment. This liver revealed lesions similar to those described in the above cases. The diagnosis was the same in this case as above.

There is a possibility that the diarrhea described in the latter case was a forerunner of the liver lesions which developed later. In the study of animals which have died of an acute diarrhea, organisms staining characteristically of *Actinomyces necrophorus*

have been demonstrated in rather large numbers in intestinal scrapings.

ORCHITIS IN BULLS AND BOVINE INFECTIOUS ABORTION

Several specimens of testicles from bulls which had shown a marked orchitis have been received. From such cases the Bang bacillus, in pure culture, has been isolated. An example of this (B. A. I. 14536) was reported by one of us (Barnes)¹ as bull 37 (fig. 3.) In the more recent cases the information

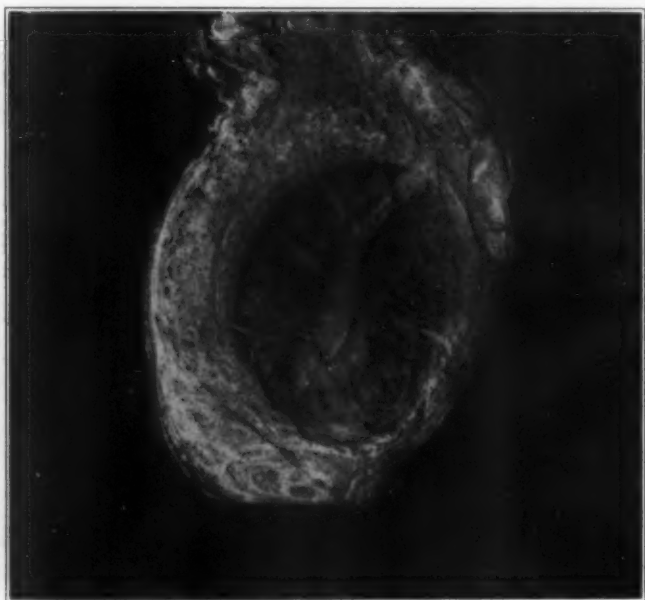


FIG. 5. B. A. I. 19829. Section of testicle of a bull which reacted to the abortion blood-test, showing orchitis, periorchitis, epididymitis, cord enlargement, fibrous tissue formation and adhesions.

accompanying the specimens has been to the effect that the bulls had given a positive reaction to the agglutination test for bovine infectious abortion (Bang bacillus disease). The pathologic process presented in acute cases has varied in its location, in that it sometimes centers in the testicle proper and sometimes in the tissues surrounding that organ, or both, and in the testicular cord. In some instances the most marked lesion is swelling, with areas of beginning necrosis. One specimen (B. A. I. 19928) from a bull, 15 years of age, which had reacted to the abortion blood test since 1915, showed testicles of about normal size.

One testicle showed nodules scattered throughout its substance while the other showed circular areas of fibrous tissue massed together and completely replacing the normal testicular tissue. (See figure 4.) No attempt at bacteriological examination of th is specimen was made. It appears that the longer standing cases tend toward nodular formation and, later, to fibrous replacement. Bovine infectious abortion causes many cases of orchitis and peri-orchitis, with the formation of pus, from which, during the onset stages, the Bang bacillus can be isolated in pure culture. (See figures 5 and 6.)

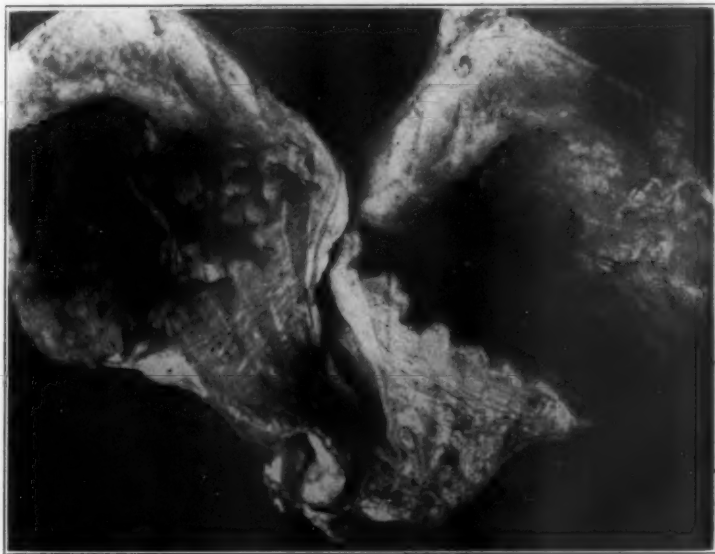


FIG. 6. B. A. I. 21267. Greatly enlarged testicle from a bull which reacted to the abortion blood-test, showing fibrous tissue and adhesions and having the testicle proper completely replaced by one large abscess.

A bull which had been negative to the blood test for bovine infectious abortion, from the time of birth until about two years of age, was used in a herd in which this disease was present and developed a severe orchitis with extensive swelling of one testicle and cord, and unilateral swelling of the scrotum. Upon examination of the blood, a positive reaction in all dilutions up to 1 to 5000 was shown. This animal is still under observation and at present the swelling has reduced somewhat in size and the titre of the blood has reduced to 1 to 200. This animal has not been used for service for a couple of years. He is now

under observation in an experimental study at the Pennsylvania Bureau of Animal Industry Experiment Farm. (See figure 7.)

These nodular lesions found in the testicles of bulls can readily be mistaken macroscopically for tuberculosis and actinomycosis, while microscopic studies and test-animal inoculations eliminate these two diseases. The authors do not care to state that the



FIG. 7. Photograph showing the scrotum of a bull now under observation. This bull reacted to the abortion blood-test in all dilutions up to 1-5000 at the time the picture was taken. The left side of the scrotum and spermatic cord were greatly enlarged. The right testicle on palpation appeared free of adhesions and normal in size.

older, or long-standing, cases are due to Bang bacillus infection, but all available evidence convicts that organism.

In this connection, data at hand indicate that the percentage of service bulls reacting to the agglutination test for bovine infectious abortion (Bang bacillus disease) is just as high or possibly somewhat higher than that of mature females.

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¹Barnes, M. F.: Bovine infectious abortion—prevention and control. Jour. A. V. M. A., lxvii (1925), n. s. 20 (1), p. 69.

***See Philadelphia—September 13-14-15-16.
Rich in History; active in Industry;
Renowned in Medical Science.***

REVIEW

THE BUREAU OF ANIMAL INDUSTRY. ITS HISTORY, ACTIVITIES AND ORGANIZATION. Fred Wilbur Powell, Editor, The Institute for Government Research. Service Monograph of the U. S. Government, No. 41. 190 pages. The Johns Hopkins Press, Baltimore, 1927. Cloth, \$1.50.

The appearance of this monograph from the Institute for Government Research is particularly timely, in view of the effort that is being made to secure better remuneration for our veterinarians in the Bureau of Animal Industry service. The Institute for Government Research is a group of citizens organized for the purpose of cooperating with public officials in the scientific study of government, with a view to promoting efficiency and economy in its operation and advancing the science of administration. To this end, the Institute has undertaken the preparation of a series of monographs, of which the subject of this review is one, giving a detailed description of each of the fifty or more branches of the government service.

All prepared according to a uniform plan, these monographs give, first, the history of the establishment and development of the service; second, its functions, described not in general terms, but by detailing its specific activities; third, its organization for the handling of these activities; fourth, the character of its plant; fifth, a compilation of or reference to the laws and regulations governing its operation; sixth, financial statement, showing its appropriations, expenditures and other data for a period of years; and finally a full bibliography of the sources of information, official and private, bearing on the service and its operation.

These monographs should prove to be of inestimable value to executive officials, to members of Congress and to the public at large. They can be considered as reliable sources of unbiased information. Provisions have already been made for revising these monographs, from time to time, to the end that they may, as far as practical, be kept up to date and reflect the true state of affairs in any arm of the government service, at any time. These studies are wholly descriptive in character. No attempt is made in them to criticise existing conditions nor to suggest changes that might be made with advantage.

Chapter I deals with the history of the Bureau of animal Industry; Chapter II, its activities; and Chapter III, its organization. Most of this information is fairly familiar to veterinarians, but it is very convenient to have all of this data combined in such a compact and convenient form. Appendix I, consisting of sixty-four pages, gives an outline of the organization of the Bureau of Animal Industry, showing the units of the organization; classes of employees; the number in each classification; and the annual salary rate. Appendix 7, covering some twenty-six pages, contains a bibliography, listing only those references which deal directly with the Bureau of Animal Industry, its history, activities, organization, methods of business, problems, etc. No attempt has been made to include in this bibliography any of the scientific publications by members of the Bureau staff.

***See Philadelphia—September 13-14-15-16.
Rich in History; active in Industry;
Renowned in Medical Science***

ABSTRACTS

STUDIES ON THE TREATMENT OF MICROFILARIA IMMITIS INFECTION BY INTRAVENOUS INJECTION OF NATRIUM ANTIMONY TARTRATE. Shiro Itagaki and Rokuro Makino, Veterinary Department of the Faculty of Agriculture of the Tokio Imperial University. Jour. Japanese Soc. Vet. Sci., vi (1297), 1, pp. 1-23.

Favorable results are reported from this treatment. The authors state that intravenous doses of from 0.003 to 0.004 grams per kilo body weight, in normal saline solution, at intervals of one, two or several days, cause the filarial larvae to disappear from the peripheral blood for several months, while a large number of adult worms in the heart were found to be still alive. They state: "From this observation there can be no doubt that the intravenous injection of sodium antimony tartrate may have a satisfactory anthelmintic action against microfilaria in the blood as well as in the uterus of adult worms."

We hope some of our southern practitioners will try this treatment and report.

N. S. M.

BACTERIA IN MUSCULAR TISSUES AND BLOOD OF APPARENTLY NORMAL ANIMALS. A. F. Reith. Jour. Bact., xii (1926), p. 367. Abst. in Jour. Amer. Med. Asso., lxxxviii (1927), 4, p. 276.

Reith says that cultures of the muscular tissues of slaughtered hogs showed the presence of bacteria in 77 per cent of 216 samples examined; 37 per cent of the samples contained anaerobes. Cultures of the muscular tissues of healthy live hogs, rabbits and guinea pigs showed the presence of bacteria in 83 per cent of 108 samples examined; 49 per cent of the samples contained anaerobes. Cultures of the blood of healthy live hogs, rabbits and guinea pigs showed the presence of bacteria in 84 per cent of thirty-eight samples examined; 39 per cent of the samples contained anaerobes. A brief period of starvation of hogs (from thirty-six to forty hours) did not have an appreciable effect on the presence of bacteria in the blood, or on the types of bacteria found.

EFFECTS OF "SANOCRY SIN" IN TUBERCULOSIS. B. Lange and A. Feldt. Zeit. für Hyg. Infektionskrankh., cvi (1926), p. 692. Abst. in Jour. Amer. Med. Asso., lxxxviii (1927), 5, p. 363.

In experiments in vitro, Lange and Feldt found that a 1:100,000 dilution of "Sanocrysin" had an inhibitory effect on the development of certain strains of tubercle bacilli. "Sanocrysin" treatment of tuberculous guinea pigs, rabbits, calves and sheep did not yield therapeutic results. It was difficult to judge the remedy. There was a difference in the reaction to tuberculosis in the individual animals; some were able to overcome the infection spontaneously.

***Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16***

VETERINARIANS COOPERATE WITH RAILROAD

The Pennsylvania Bureau of Animal Industry cooperated with the New York Central Railroad by getting up an exhibit, depicting the work of the former organization in connection with abortion and tuberculosis in dairy cattle. This exhibit was shown on the New York Central Railroad train which toured Pennsylvania during May, in connection with educational work for boys and girls along dairy industry lines. The exhibit was in charge of Dr. John H. Winstanley, of the Pennsylvania Bureau of Animal Industry.

PUBLICATIONS RECEIVED

- Union of South Africa Department of Agriculture, 11th and 12th Reports of the Director of Veterinary Education and Research. Part II, January, 1927. Pretoria. pp. 818-1361. Illustrated.
- Housing Farm Poultry. L. E. Card and W. A. Foster. (Cir. 315, Univ. of Ill., Agr. Coll. & Exp. Sta., Urbana, Ill., February, 1927. pp. 20. Illustrated.)
- Control of Abortion Disease. I. E. Newsom and Floyd Cross. (Bul. 317, Colo. Agr. Coll. Exp. Sta., Fort Collins, Colo., March, 1927. pp. 30.)
- The Register of Veterinary Surgeons. Royal College of Veterinary Surgeons, London, 1927. pp. 380.
- Michigan Humane Society, Second Annual Report for 1926. Detroit, Mich., 1927. pp. 34. Illustrated.
- New York State Veterinary College at Cornell University for the Year 1925-1926, Report of the. Legislative Document (1927) No. 28. Albany, N. Y. pp. 196.
- New York State Veterinary College, Announcement for 1927-28. Ithaca, N. Y., April 1, 1927. pp. 32.
- Georgia State College of Agriculture, Catalogue 1927-1928. Athens, Ga., March, 1927. pp. 138. Illustrated.
- Relation of White Snakeroot to Human Milk Sickness. Albert A. Hansen. Lafayette, Ind. Reprint from *Journal of the Indiana State Medical Association*, xx (1927), pp. 182-187.
- Agriculture Calls You. Catalog of the Long and Middle Courses 1927-28, College of Agriculture, Univ. of Wisconsin. Serial No. 1429 Bul., Univ. of Wis. Gen. Series No. 1205. pp. 50. Illustrated.
- Kansas State Agricultural College Bulletin, Division of Veterinary Medicine, Announcement for 1927-28. Manhattan, Kansas, May 16, 1927. pp. 27. Illustrated.
- Napier Grass for Livestock. F. R. Edwards. (Press Bul. 257, Ga. Exp. Sta., Dept. of Animal Industry, May 14, 1927. p. 1.)
- Ontario Veterinary College, Session 1927-1928, Calendar of the. Guelph, Ont. pp. 51.
- Fowl Tuberculosis in Swine. Robert Graham and E. A. Tunnicliff. Urbana, Ill. Reprint from *Transactions of the Illinois State Academy of Science*, xix. pp. 138-143.
- Philippine Islands, Twenty-Fourth Annual Report of the Bureau of Science, for the year ending December 31, 1925. Wm. H. Brown. Manila, 1927. pp. 63.
- Comparative Pathology of South African Jagziekte and Montana Progressive Pneumonia of Sheep. E. V. Cowdry and Hadleigh Marsh. Reprint from *Journal of Experimental Medicine*, xlv (1927), 4, pp. 571-585. Illustrated.
- Michigan State Veterinary Medical Association Year Book. Proceedings of the 44th Annual Meeting, East Lansing, Mich., June 22-23, 1926. pp. 58.
- Manson's Eye Worm in Poultry. D. A. Sanders. (Press Bul. 395, Univ. of Fla. Agr. Exp. Sta., Gainesville, Fla., May, 1927. pp. 2.)
- Florida Agricultural Experiment Station, University of. Report for the fiscal year ending June 30, 1926, Gainesville, Fla. pp. 125. Illustrated.

**Attend the meeting in Philadelphia
September 13-14-15-16,
Where many things began and the best continue**

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Captain William H. Dean is relieved from assignment and duty at the Cavalry School, Fort Riley, Kansas, effective upon the completion of his present course of instruction, and will then report in person to the commanding general, Fort Riley, Ks., for assignment to duty.

First Lieutenant Frank M. Lee, Purchasing and Breeding Headquarters, Colorado Springs, Colo., has been promoted to the grade of captain, effective May 16, 1927.

Captain John H. Kintner is relieved from further assignment and duty at the Army Veterinary School, Army Medical Center, and upon completion of temporary duty at Camp Knox, Kentucky, will proceed to Fort Sill, Oklahoma, for duty.

Reserve Corps

New Acceptances

Dickman, Andrew Jackson..	Capt.....	1423 State St., Boise, Idaho.
Goubeaud, Geo. Jos.....	Capt.....	467 Myrtle Ave., Flushing, N. Y.
Harris, James G.....	Capt.....	1914 E. 6th St., Duluth, Minn.
Morin, Joseph R.....	Capt.....	37 Talcott Ave., Rockville, Conn.
Stephenson, Oscar.....	Capt.....	607 E. N. 2nd St., Sweetwater, Tex.
Talbert, M. W.....	Capt.....	Morristown, Ind.
Gordon, Wm. Dane.....	1st Lt.....	Morristown, Ind.
Alvarez, A. A.....	2nd Lt.....	Mayaguez, Porto Rico
Parmer, Harry Wm.....	2nd Lt.....	Ida Grove, Minn.

Separations

Adamson, Geo. V.....	Capt.....	Resigned.
Melchiorson, Wm. Geo.....	Capt.....	Died.
Davis, Howard B.....	1st Lt.....	O. R. C. status terminated.
Leavitt, Charley H.....	1st Lt.....	Resigned.
White, Floyd H.....	1st Lt.....	O. R. C. status terminated.

***See Philadelphia—September 13-14-15-16.
Rich in History; active in Industry;
Renowned in Medical Science***

PRIZE ESSAY AWARDS

The subject chosen by Colonel W. Geo. Turner, director of the Veterinary Corps, for the 1927 essay contest for prizes offered by the A. V. M. A., was "The Importance of Meat and Dairy Inspection in Maintaining the Health of Troops."

According to a letter recently received from Colonel Turner, first prize (\$50.00) this year was awarded to Mr. Earl F. Graves, a senior student in the Division of Veterinary Medicine of Kansas State Agricultural College and second prize (\$25.00) to Mr. Wm. Edward Welsh, a senior student in the Division of Veterinary Medicine of Iowa State College.

Although there was a slight increase in the number of students competing this year, the number is not yet what it ought to be. Considering the fact that these prizes are in cash and awarded at a time when students' funds are usually at a low ebb, it is difficult to understand why there have not been more entries in the two contests held thus far. Suggestions are invited.

***Attend the meeting in Philadelphia,
September 13-14-15-16,
Where many things began and the best continue***



Statue of William Penn on Top of City Hall Tower, Philadelphia.

MISCELLANEOUS

TESTING FEEDER CATTLE

Many people seem to be of the opinion that tuberculosis is confined almost entirely to dairy cattle and that feeding cattle seldom contract this disease, but such is not the case. It is true that a higher degree of infection is found, on the average, among dairy cattle and this is probably due to closer housing, heavier feeding and crowding for milk production. On the other hand, feeding heifers and steers will contract the disease readily on exposure and high percentages of these cattle are infected in some sections of the country. Figures recently compiled show the reports of tests of feeding cattle for shipment into Michigan, during the year ended February 1, 1927.

Results of Tests of Feeding Cattle Intended for Shipment into Michigan During Year Ended February 1, 1927

TESTED AT	FEMALES			STEERS			TOTAL TESTED	REACTORS	% REACTORS
	No.	REACTORS	%	No.	REACTORS	%			
Chicago	1106	63	5.7	945	35	3.7	2051	98	4.6
St. Paul	1035	51	4.9	361	24	6.6	1396	75	5.4
Kansas City	547	6	0.5	44	0	0.0	591	3	0.5
Total	2688	117	4.3	1350	59	4.3	4038	176	4.3

From these figures we find that 59 reactors were found among 1306 steers tested at Chicago and St. Paul during the past year for shipment to Michigan feed-lots. This is 4.5 per cent infection, as compared to 1.76 per cent infection revealed by the test of more than 488,000 cattle in Michigan during 1926. These figures show the importance of testing all cattle in order that sources of infection may be reduced to a minimum, and prove the wisdom of some of the Boards of Supervisors in petitioning for a quarantine requiring the test of all cattle, including steers, coming into clean counties.

—Michigan Veterinary News.

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RESTRICTED AREA CELEBRATES

A banquet was served at the Silver Plate Hotel, Govan, Saskatchewan, June 14, 1927, celebrating the first anniversary of the establishment of the first Restricted Area in Saskatchewan. The occasion reflected the attitude of the district toward tuberculin testing. According to Dr. F. A. Humphreys, Health of Animals Branch, in charge at Govan, the district is also constituted a Pure Bred Sire Area, the use of grade bulls being prohibited.

Dr. Humphreys forwarded the following selections from the song-sheet, used at the banquet:

T. B. has gone. Good-bye, good-bye.
Reactors, all, have gone to die,
So let your voice ring like a bell,
And tell the world T. B.'s in . . . l.

Now let us sing, both loud and clear,
So all will know we have no fear,
Because our sires are of the best,
As we will make the scrub "go west."

BETTER BULLS

Tune "Smiles"

There are bulls that make us happy,
There are bulls that make us glad.
There are bulls that should be used for wieners,
There are bulls that surely make us mad,
There are bulls that always are just "boarders,"
It's a cinch that that kind never pay,
Thank God for the First Pure Bred Sire Area,
Scrubs too long have had their sway.

THE OLD SCRUB BULL

The old scrub bull, he ain't what he ought to be;
He ain't what he ought to be; he ain't what he ought to be,
The old scrub bull, he ain't what he ought to be;
Since many years ago.

Chorus

Since many years ago; since many years ago.
The old scrub bull he ain't what he ought to be,
Since many years ago.

***Meet thy friends in the Friendly City—
Philadelphia, September 13-14-15-16***

Lem Hawkins, who owns the general store, says that one day he had a turkish towel hanging outside the store, and a tramp came in and asked how much was the tripe a pound. But that ain't as funny as the time he had cocoanuts outside and a hobo came in and asked how much for them potatoes—with hair on them.

—*Life.*

LANCASTER WINS FIGHT FOR PURE MILK

On May 9, 1927, the Pennsylvania Supreme Court handed down a decision which marked the climax of a court fight waged between the city officials of Lancaster, Pa., and certain dairy-men doing business in that city. The case had been under litigation for about a year and the local courts granted a total of fifty-four injunctions, the last of which was dissolved on May 25. On March 5, 1927, Judge Charles I. Landis ruled that the Lancaster City Council had the right to enact ordinances regulating the local milk supply. This decision was appealed to the Supreme Court, which body in turn sustained the decision of the lower court.

According to Dr. H. B. Mitchell, supervisor of the Milk Inspection Bureau of the City of Lancaster, a survey of the immediate territory indicates that there is a plentiful supply of milk to be obtained from tuberculin-tested herds, in spite of statements to the contrary, and plans are being made for the immediate enforcement of the ordinance that was in question for such a long time. About seventeen dealers are affected by the decision and they will have either to meet the requirements of the ordinance or dispose of their products elsewhere.

It is recalled that the first court decision upholding a city ordinance, requiring that milk come from tuberculin-tested herds, was rendered in Minneapolis, in 1909, when Judge Brooks, of the District Court, denied the application of several milk dealers for an injunction restraining the city health department from enforcing the ordinance.

***Attend the meeting in Philadelphia,
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Where many things began and the best continue***

NATURALLY

Tired Tim knocked at the door of a cottage. It was a chilly day and he was very hungry.

The old lady who opened the door was a good sort. She asked him into the kitchen and placed before him a nicely cooked meal and asked him why he did not go to work.

"I would," replied Tim, "if I had the tools."

"What sort of tools do you want?" inquired the old lady.

"A knife and fork," said Tired Tim.—*True Story.*

PACKERS AND STOCKYARDS ADMINISTRATION ABOLISHED

The Packers and Stockyards Administration, by order of Secretary of Agriculture Jardine, is abolished, effective July 1, and from that time the enforcement of the Packers and Stockyards Act of 1921 will be under the chief of the Bureau of Animal Industry, Dr. J. R. Mohler.

The amended General Rules and Regulations for carrying out the provisions of the act have been further amended by substituting the words "Bureau of Animal Industry" for the words "Packers and Stockyards Administration." All employes of the Packers and Stockyards Administration were transferred, June 30, to the Bureau of Animal Industry.

This change in organization in the Department of Agriculture follows the general plan of carrying on the regulatory work in a more orderly and logical manner and with more efficiency and economy. Several laws relating to the live stock industry, including the Virus-Serum Act, Tuberculosis Eradication Act, Tick Eradication Law, Twenty-eight Hour Law, Animal Quarantine Act, etc., are enforced by the Bureau of Animal Industry and, in the opinion of the Secretary, much overhead expense can be saved by adding the Packers and Stockyards Act to this related group. Furthermore, the Bureau of Animal Industry, with approximately 4000 employes scattered throughout the country, is in close contact with the live stock industry at many points and has numerous channels of information which make possible prompt and intelligent action. This bureau was formed primarily to carry on enforcement work, the organic act providing for "the promulgation and enforcement of quarantines by the Secretary to control the spread of communicable diseases of animals."

There has, of course, been cooperation between the Packers and Stockyards Administration and the Bureau of Animal Industry but it was only voluntary. The reorganization makes the relationship of the enforcement of the Packers and Stockyards Act to other live stock regulatory work more stable. The entire industry will have a single contact point in the Department of Agriculture.

This movement for better organization of regulatory work is in line with the action recently taken by the Secretary of Agriculture in placing the regulatory work carried on by the Bureau

of Chemistry in the Food, Drug and Insecticide Administration, a new unit to take form July 1, and which also is to include the regulatory work now carried on by the Insecticide and Fungicide Board.

***Thee and thine to the City of Penn;
Forget not when—September 13-14-15-16***

WORK FOR SOME VETERINARIAN

Conductor: "Hello, Subbs! What's in the big bag—garden seeds?"

Commuter: "Not exactly. Going to plant it in my garden, though. It's arsenic."

Conductor: "Great Scott! What do you expect to raise?"

Commuter: "The mortality rate among my neighbors' cats, dogs and poultry."—*Christian Advocate*.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***

BUREAU TRANSFERS

Dr. Howard L. Box (O. S. U. '15), from Toledo, Ohio, to El Paso, Texas, on meat inspection.

Dr. Lee Roy Trompeter (K. C. V. C. '16), from South St. Paul, Minn., to Madison, Wis., on tuberculosis eradication.

Dr. John O. Schlegel (K. C. V. C. '11), from Kansas City, Kans., to South St. Paul, Minn., on meat inspection.

Dr. Z. A. Oviatt (Iowa '22), from Chicago, Ill., to Omaha, Nebr., on meat inspection.

Dr. Edward Himsel (Cin. '13), from Omaha, Nebr., to Pueblo, Colo., in charge of meat inspection.

Dr. Benj. F. Gooch (K. C. V. C. '07), from Pueblo, Colo., to Kansas City, Kans., on meat inspection.

Dr. Clarence E. Hart (K. C. V. C. '05), from Kansas City, Kans., to National Stock Yards, Ill., on meat inspection.

Dr. Frank J. Scheloski (K. C. V. C. '11), from Kansas City, Kans., to Milwaukee, Wis., on meat inspection.

Dr. John B. Hollenbeck (Ont. '95-McK. '00), from Bismarck, N. D., to Lincoln, Nebr.

Dr. Warren Sorrell (K. C. V. C. '07), from Lincoln, Nebr., to Frankfort, Ky.

Dr. Herman T. Ludwig (O. S. U. '13), from Louisville, Ky., to Wheeling, W. Va., on meat inspection.

Dr. Earl E. Manter (O. S. U. '13), from Wheeling, W. Va., to Allentown, Pa., on meat inspection.

Dr. Chas. G. Haber (O. S. U. '16), from New York, N. Y., to Dayton, Ohio, on meat inspection.

COMMENCEMENTS

KANSAS STATE AGRICULTURAL COLLEGE

The sixty-fourth annual commencement exercises of the Kansas State Agricultural College were held at Manhattan, June 2, 1927. In the Division of Veterinary Medicine, the degree of Doctor of Veterinary Medicine was conferred upon the following:

Earl Francis Graves Norman Hamilton Howell
Horace Arthur Mills

The honor student of the Veterinary Division was Earl Francis Graves, who also received a commission of Second Lieutenant in the Veterinary Officers' Reserve Corps.

Dr. Charles H. Kitselman (U. P. '18) received the degree of Master of Science.

**Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16**

COLORADO AGRICULTURAL COLLEGE

The commencement exercises of the Colorado Agricultural College were held June 2, 1927. The commencement address was delivered by Jesse H. Newlon, superintendent of the Denver city schools.

In the Division of Veterinary Medicine the following graduates received the degree of Doctor of Veterinary Medicine:

Albert J. Beatty	A. Morton McCapes
George T. Beard	Bryce R. McCrory
Chester M. Hamilton	Tom A. Moir
James B. Harrison	Ray H. Pease
Lysle J. Lanphere	William E. Ruggles
Valerian Todorovic	

Tom A. Moir received the honors for scholarship.

**Meet thy friends in the Friendly City—
Philadelphia, September 13-14-15-16**

MICHIGAN STATE COLLEGE

The commencement exercises of the Michigan State College were held June 10, 1927. Seven members of the graduating class received the degree of Doctor of Veterinary Medicine:

Fred J. Brockett	Harold J. Hollinger
Hollis H. Clark	Morris F. Lamoreaux
Ebenezer E. Harvey	Donald B. Meyer
Claude H. Reading	

At the close of the fall term, Elmer E. Johnson completed his course and received his degree at the regular commencement.

The Michigan State Veterinary Medical Association Prize of \$25, for the graduate having the best scholastic record for the senior year, was awarded to Fred Brockett, of Suffield, Conn.

***See Philadelphia—September 13-14-15-16.
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CORNELL UNIVERSITY

The fifty-ninth annual commencement exercises at Cornell University were held, June 13, 1927. The degree of Doctor of Veterinary Medicine was conferred upon the following:

Donald Holston Andrews	Cornelia Jaynes
Harry Preston Aronson	Kenneth Wilbur Keyes
Reimer A. Asmus	Willard George Lockwood
James DeSett Bennehoff	Alphonso Collins Newman
Russell Berkins Booth	Robert Kenneth O'Neil
William Caslick	Harold Croft Parker
James Stuart Crawford	Arthur Mathias Rindell
Stanley Eugene Ferguson	William Joseph Sellman
Dana Delancey Ford	Garland Douglas Stone
Robert Globus	John Cephas Thomson
Arnold Edward Hilbert	Floyd Joseph Tice
Warren Fowler Hoag	Arthur Trayford
	Stuart Leroy Wright

The following prizes were awarded for the academic year 1926-1927:

The Horace K. White Prizes:

First Prize.....	Arthur Trayford
Second Prize.....	Cornelia Jaynes

The Hollingworth Honorarium..... William Caslick

The James Gordon Bennett Prize..... William Joseph Sellman

The Jane Miller Prizes:

First Prize.....	Wayne Arthur Kelly
Second Prize.....	Charles Jonas Parshall

The Anne Besse Prize..... { Harold Croft Parker
Stuart Leroy Wright

***Thee and thine to the City of Penn;
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STATE COLLEGE OF WASHINGTON

The commencement exercises of the State College of Washington were held, June 13, 1927. Three graduates from the

College of Veterinary Medicine received the degrees of Bachelor of Science in Veterinary Medicine and Doctor of Veterinary Medicine:

Mansil O. Barnes

Paul H. Reed

Severino Sebastian

Dr. Reed is to become associated with Dr. E. A. Ehmer, of Seattle, Wash. Dr. Barnes expects to return to his home, at Lewiston, Idaho, and enter practice there. Dr. Sebastian will probably engage in private practice, at Jones, Isabella, Philippine Islands.

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OHIO STATE UNIVERSITY

The commencement exercises of the Ohio State University were held in the Coliseum of the Ohio State Fair Grounds, June 14, 1927. Of the 1080 degrees granted, nine were in veterinary medicine. Of these nine, two held baccalaureate degrees and one candidate, Walter Roland Krill, was granted two degrees, having completed the combined course in agriculture and veterinary medicine. Approximately 7000 people attended the exercises, which followed very closely those of preceding years. The following received the doctorate in veterinary medicine:

Cyrus Paul Brose

Walter Roland Krill

Ernest Milton Dickinson

Ellsworth McElwee

Russell Emmett Hammond

Lewis H. Moe

Einer William Johansen

Samuel Wright Neeley

Leonard Erwin Swanson

With the exception of Dr. Krill, all graduates received commissions as second lieutenants in the Veterinary Reserve Corps of the United States Army.

***Meet me where the Continental Congress met;
Sign where the Declaration of Independence was signed—
In Philadelphia. September 13-14-15-16***

UNIVERSITY OF PENNSYLVANIA

At the 171st commencement exercises of the University of Pennsylvania, held June 15, 1927, the degree of Doctor of Veterinary Medicine was conferred upon the following:

Harry Morris Corenzwit

Lynn Allen Peterson

George Marcus Leighow

Harry Baumiller Steinbach

Charles Eber Massinger

Allen Stearne Vansant

Stevenson Moore, Jr.

Edward Addison Webb

Max Louis Wendler

The J. B. Lippincott Prize of \$100 for the highest general average for the entire four years of the course was awarded to Harry M. Corenzwit.

The T. E. Munce Prize of \$25 for the highest general average in the courses in Animal Industry was awarded to Lynn A. Peterson.

The Jeannette Blair Prize of \$50 for the best work in the Small Animal Clinic was awarded to Allen S. Vansant.

A certificate was awarded to William Clyde Mitchell, D. V. S., for the completion of the graduate course in bacteriology and pathology.

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UNITED STATES COLLEGE OF VETERINARY SURGEONS

The last of the private veterinary schools closed its doors, June 15, 1927, with the thirty-third annual commencement exercises of the United States College of Veterinary Surgeons, in Washington, D. C.

Addresses were made by George A. Prevost, patent attorney, a trustee of the school for thirty-three years; Raymond Neudecker, Assistant United States Attorney, and Dr. C. Zabel Robinson, president of the institution.

There were four in the graduating class:

James Henry Coleman
Edward Mercer Cooper

James Warfield Crowl
Francis Charles Howard

***Meet me where Penn met the Indians—
Philadelphia—September 13-14-15-16***

NEWS ITEMS

Two veterinarians of Cleveland, Ohio, filed a petition in bankruptcy recently and listed their assets as one baboon, five monkeys, one black bear, ten canaries and fourteen dogs.

The Humane Society, of Lexington, Ky., recently decided to discontinue the free clinic for vaccinating dogs against rabies, on account of the indifference of the public to the service offered by the Humane Society.

ASSOCIATION MEETINGS

CENTRAL MICHIGAN VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Central Michigan Veterinary Medical Association was held at Jackson, May 25, 1927. About thirty veterinarians, many of them accompanied by their wives, were in attendance. In the absence of the president, Dr. Fred W. Main, Dean Ward Giltner was called to the chair to preside over the meeting. Secretary Armstrong announced that he had sent invitations to twenty or more veterinarians and had asked each one to contribute a case report to the program. Dr. Giltner proceeded to call upon the different practitioners present, to describe some interesting case that they had met in their practice.

The first case described was a very unusual one, namely, what apparently was a case of emphysema in a turkey gobbler, reported by Dr. W. N. Armstrong, of Concord, Mich. Dr. L. A. Wileden, of Mason, reported a number of atypical cases of milk fever. These exhibited the well-known symptoms of this condition, but failed to respond to the usual treatment. A splendid discussion of the subject followed and a number of veterinarians reported their experiences with treating cases of milk fever with glucose, either with or without the usual air treatment. The question of latent infections of the udder was thoroughly discussed in connection with the milk fever cases, as a number of veterinarians reported that, in spite of their best efforts, they had been unable to prevent mastitis from following in a number of cases treated for milk fever.

Dr. J. H. Lenfestey, of Lyons, Ohio, reported his experiences with sacral anesthesia. He had found this to be of the greatest value in eversion of the uterus. Other veterinarians reported the use of sacral anesthesia in docking the tail in the horse and in amputation of the claws in cattle.

A very interesting discussion of the Veterinary Practice Act, as well as the present organization of the Michigan Department of Agriculture, followed. This discussion was led by Drs. Tobin and Ruff. Dinner was served at six o'clock, after which the members adjourned to the Fair Grounds to witness a polo game.

VETERINARY ALUMNI SOCIETY, UNIVERSITY OF PENNSYLVANIA

The annual meeting of the Alumni Society of the School of Veterinary Medicine, University of Pennsylvania, was held on June 11, 1927. The outstanding features of the meeting were the large attendance and enthusiasm of the members.

Dr. J. H. McNeil, president of the Society, called the meeting to order in the Library of the School, at 10:30 a. m. In opening the meeting he delivered an enthusiastic address in which he called attention to the great fundamental work of Pearson, Harger and Adams, in laying the foundation of the educational work of the School; how they influenced the regulatory measures of our live stock industry as conducted by the federal and various state bureaus of animal industry, and their valuable influence on veterinary education in other schools in our country. Dr. McNeil's remarks were well received and contributed a great deal to the success and good feeling which prevailed throughout the day.

A good report by Dr. E. T. Booth, Secretary-Treasurer, was next presented.

Dean Klein reviewed the work of the School for the year and referred to the great loss sustained by the School in the death of Dr. John W. Adams. He announced the addition of a laboratory course in pharmacology to the curriculum, told of some of the research work under way and spoke at length on the development of the graduate and special courses which were inaugurated at the beginning of the present session, stressing the advantages of the cooperation of the Graduate School of Medicine and the School of Medicine in the graduate courses.

Dr. S. H. Gilliland, member of the Board of Directors of the General Alumni Society of the University of Pennsylvania, representing the veterinary alumni, presented a report which was full of interesting facts.

Dr. C. J. Marshall, chairman of the Veterinary Alumni Fund Committee, gave an encouraging report of the status of the contributions to date. The largest contribution from an alumnus during the year was \$1,000 from a member of the class of 1891. A substantial legacy was received from the late Mr. Walter Lippincott. The class of 1927 went over the top with 100 per cent contributors. The class of 1911 had the second largest number. It is believed that the new system of annual giving is

preferable to the original plan, adopted in 1925, and that when understood by our alumni a large percentage of them will participate.

The following officers were elected: President, Dr. Joseph G. Moon; first vice-president, Dr. E. L. Stubbs; second vice-president, Dr. Edward A. Rile; secretary-treasurer, Dr. E. T. Booth; historian, Dr. V. G. Kimball.

Dr. Roger S. Amadon was elected a member of the Society.

Following the business meeting the members repaired to Pearson Hall, where they enjoyed an excellent dinner, music and other entertainment.

Prizes were awarded as follows:

First—Dr. J. P. Bushong, of Los Angeles, California, for coming the greatest distance.

Second—Class of '87 for largest percentage in attendance.

Third—Dr. H. B. Mitchell, largest alumnus.

Fourth—Dr. Wm. M. McCarthy, smallest alumnus.

Franklin Field was then visited, where a splendid ball game was witnessed between Harvard and Pennsylvania, the final score being: Harvard, 1; Pennsylvania, 4.

G. A. DICK.

MINNESOTA OFFERS FINE PROGRAM

The sixth annual short course for veterinarians and the twenty-ninth semi-annual meeting of the Minnesota State Veterinary Medical Association will be held at University Farm, July 14-15, 1927. Among the speakers will be Dr. Cooper Curtice, of the Bureau of Animal Industry, Washington, D. C.; Dr. Alvin Broerman, of the Division of Animal Industry, Reynoldsburg, Ohio; Dr. J. O. Wilson, Inspector-in-Charge, U. S. Bureau of Animal Industry, Pierre, S. D.; Mr. H. R. Smith, of the Union Stock Yards, Chicago; Dr. A. F. Schalk, of the North Dakota Agricultural College, Fargo; Dr. H. E. Bemis, of the Iowa State College, Ames; Dr. A. T. Kinsley, of the Kinsley Laboratories, Kansas City; and Dr. T. A. Sigler, president of the American Veterinary Medical Association, Greencastle, Indiana.

As usual, the State Association combines with the University in preparing this program. The meetings have been largely attended in the past and Secretary Fitch looks for a full attendance again this year.

MISSOURI VALLEY MEETING

Secretary Steel announces that the summer meeting of the Missouri Valley Veterinary Association will be held at the Elks Club, Omaha, Nebr., July 11-12-13. The morning session of the first day will be devoted largely to business, and the afternoon session, as well as both of the sessions of the second day, will be given over to the scientific program. The third day will be devoted to a clinic. Quite a number of nationally prominent veterinarians will contribute to the program, among whom will be Dr. Thomas A. Sigler, president of the A. V. M. A., who will discuss some of the present-day problems of the veterinarian and how the A. V. M. A. is attempting to solve them. All branches of veterinary practice will receive their share of attention. The evening of the second day there will be a meeting of the Kansas City Veterinary College Alumni Association, as well as a reunion of the class of 1917.

NORTHEASTERN PENNSYLVANIA VETERINARY MEDICAL CLUB

A meeting of the Northeastern Pennsylvania Veterinary Medical Club was held at the Donovan Hotel, Montrose, June 18, 1927, at which time Dr. Louis A. Klein, Dean of the Veterinary School of the University of Pennsylvania, gave a lecture on "The Action of Drugs on the Reproductive Organs of Animals," which was very interesting and instructive, especially to the busy practitioner.

The wives and friends of the veterinarians are invited to the summer meetings of the Club. On this occasion the ladies were entertained with card games, while the gentlemen were in session.

The next meeting will be held the latter part of July, at the Montrose Beef Company, Pittston, at the request of Dr. J. R. Donnelly, of the federal Bureau of Animal Industry, at which time postmortems will be held on tuberculous cattle, and a lecture will be given by Dr. C. J. Marshall, of the University of Pennsylvania.

Roll-call showed twenty veterinarians in attendance.

THOS. D. JAMES, *Secretary*

The bill introduced in the Illinois Legislature by Representative Tice, to exempt veterinarians from jury service, passed the Senate and has been sent to the governor for his action.

NECROLOGY

FRED N. FRISCH

Dr. Fred N. Frisch, of Glasgow, Montana, died of pneumonia, February 26, 1927. He had been suffering from pernicious anemia for some time. Born in St. James, Minn., in 1881, he was a graduate of the McKillip Veterinary College, class of 1912 and had been in practice at Glasgow for most of the time since graduation. He is survived by his widow, his mother, two sisters and four brothers.

CHESTER A. HOUGH

Dr. Chester A. Hough, of Holton, Kansas, died at his home, April 9, 1927, following an illness of several months. He was a graduate of the Kansas City Veterinary College, class of 1908, and had spent his entire professional career in Holton. He is survived by his widow, one daughter, his parents, three sisters and one brother.

CECIL MONROE PAXTON

Dr. Cecil M. Paxton, of Broadwater, Nebr., died suddenly, April 14, 1927. He was a graduate of the Chicago Veterinary College, class of 1886. Prior to locating in Broadwater, Dr. Paxton practiced at Kansas, Ill. He is survived by two daughters, five sisters and three brothers.

CLARK M. WEESE

Dr. Clark M. Weese, of Aurora, Ill., died at his home, Pleasant View Farm, June 3, 1927, at the age of 47. He had been in poor health for about a year.

Born in Oswego, June 9, 1879, he resided in that vicinity all his life. He was graduated from the Chicago Veterinary College in 1903, having been secretary of his class. He returned to Aurora and entered practice there, six years later joining Dr. W. B. Lane in a partnership which continued until the death of Dr. Weese.

A lover of horses, Dr. Weese was active in promoting the trotting races held at the Aurora Driving Park for many years. He served as secretary of the original association and also took

a leading part in its reorganization several years ago. Dr. Weese served as alderman of his ward, 1918-19. He was instrumental in organizing the Central States Fair and Exposition and served as a director up until his death. He was assistant state veterinarian for 20 years. Dr. Weese was a member of Jerusalem Temple Lodge No. 90 A. F. and A. M. and Aurora Commandery No. 22, Knights Templar.

He is survived by his widow.

LUTHER LEE STREET

Dr. L. L. Street died at his home in Richwood, Ohio, February 15, 1927. He was 76 years of age and was registered as a non-graduate. He practiced in Richwood for 42 years. Death was due to apoplexy.

CLARENCE C. CRIDER

Dr. Clarence C. Crider, of Mt. Vernon, Ohio, died at his home March 17, 1927. Death was due to apoplexy. Dr. Crider was 56 years of age and was a registered non-graduate practitioner.

WILLIAM H. EVEREST

Dr. William H. Everest, of Defiance, Ohio, died April 14, 1927, after an illness extending back about a year, resulting from heart trouble. He was 64 years of age.

Dr. Everest was a graduate of the Ontario Veterinary College, class of 1889, and practiced in Defiance for about 35 years. He was a member of the Ohio State Veterinary Medical Association. He is survived by his widow, two sisters and two brothers.

CHARLES RODGER MITCHELL

Dr. Charles R. Mitchell, of Owen Sound, Ontario, died at his home, June 4, 1927. He had been in failing health for some time, but his death was hastened by a fall, last January. He was in his 65th year.

Born at Port Union, Dr. Mitchell received his early education in the school at Dundalk; then he attended the Orangeville High School and later the Ontario Veterinary College. He was graduated in 1890.

Dr. Mitchell practiced a few years at Dundalk and for 25 years at Owen Sound. He is survived by his widow and two children.

DAVID O. MELTON

Dr. David O. Melton died at his home, near Samoth, Ill., April 14, 1927. He was born in Harrison County, Indiana, August 8, 1847, and located in Illinois early in life. For a number of years he was an assistant state veterinarian. He retired from active practice four years ago.

PERSONALS

MARRIAGES

Dr. P. C. Fletcher (O.S.U. '22), to Miss May Downey Oakman, both of Clinton, Ill., June 16, 1927, at Clinton, Ill.

Dr. C. L. Briggs (U. P. '26), to Miss Pearl Aurand, both of DuBois, Pa., June 16, 1927, at DuBois, Pa.

BIRTH

To Dr. and Mrs. C. E. Sawyer, of Puyallup, Wash., a daughter, Claudia Celeste, May 9, 1927.

PERSONALS

Dr. A. J. Forsyth (Corn. '12) has located for practice at Walton, N. Y.

Dr. L. N. Brogdon (Chi. '09) has re-entered general practice at Batavia, Ill.

Dr. C. W. Olson (Ont. '22) has been transferred from Tracy to New Ulm, Minn.

Dr. N. C. Nelson (Chi. '03) has resigned as Sangamon County (Ill.) Veterinarian.

Dr. W. A. Anderson (O. S. U. '26) is engaged in milk inspection work in Chicago.

Dr. C. F. Milleson (Iowa '22) is conducting a small animal practice in Portland, Ore.

Dr. C. Canion (Tex. '25) is engaged in municipal meat inspection work in Houston, Texas.

Dr. G. O. Shipley (O. S. U. '25) removed from West Liberty to West Branch, Iowa, March 1, 1927.

Dr. Walter Schumacher (Colo. '12) is employed as chemist by the Holly Sugar Company, Delta, Colo.

Dr. E. E. McDaniel (McK. '06), formerly of Marion, Ohio, has opened an office in Upper Sandusky, Ohio.

Dr. Philip Smith (Tex. '24) is general live stock superintendent for a large oil company in Tampico, Mexico.

Dr. M. Lloyd Killpack (Colo. '24), of Murray, Utah, is Scout Master, Troop 90, Salt Lake County, Utah.

Dr. R. L. Rogers (Tex. '25) combines general practice with municipal sanitary control work, in San Angelo, Texas.

Dr. James O. McCoy (Ont. '25) is in practice at Columbus, Wis., and is making a special study of the fox industry.

Dr. A. D. Spooner (Ont. '25) is in general practice at Barre, Vt. He was recently confined to his bed with pneumonia.

Dr. P. R. Carter (K. S. A. C. '26) is with the Division of Sanitation, Minnesota State Department of Health, Minneapolis.

Dr. C. R. Roberts (Corn. '22), of Norwich, N. Y., is engaged in milk and dairy inspection work for the city of New York.

Dr. J. Dwight Pierce (Chi. '18) has entered private practice at Springfield, Mass., and will continue to do some state work.

Dr. Eddie H. Durr (A. P. I. '24) is engaged in tuberculosis eradication work in North Carolina, with headquarters at Lillington.

Dr. W. R. McCullough (Tex. '25) is plantation manager and veterinarian for a 2600-acre cotton plantation at Bryan, Texas.

Dr. E. H. Patchen (O. S. U. '23) conducts dairy inspection work in connection with his general practice, in Milford, Conn.

Dr. J. S. Barber (Chi '10) recently opened the Narragansett Small Animal Hospital, at 14 Washington Street, Central Falls, R. I.

Dr. W. L. Black (Colo. '24) is engaged in research work at the Texas Agricultural Experiment Station, Substation 14, at Sonora.

Dr. B. G. Reid (Colo. '24) is in general practice at Salida, Colo., and also looks after the local inspection of meat, milk, food, etc.

Dr. G. E. Botkin (Ind. '12), of Mooreland, Ind., has moved to Marion, Ind., and entered a partnership with Dr. W. B. Wallace (Ont. '87).

Dr. George N. Cunningham (Chi. '18) addressed the Rotary Club of Freeport, Ill., on the subject of bovine tuberculosis, May 16, 1927.

Dr. John W. Van Vliet (K. S. A. C. '22), who has been at the University of Maryland, College Park, has returned to Manhattan, Kan.

Dr. Paul L. Matthews (K. C. V. C. '17) has left Pierce, Nebr., and is now in Omaha, with the United Serum Company, of Wichita, Kansas.

Dr. T. D. Van Kirk (U. S. C. V. S. '18) is back in Middleboro, Ky., after spending about six months in Washington, Pa., his former home.

Dr. H. L. Messmore (Chi. '14), of Geneseo, Ill., recently received a fracture of the first finger of his left hand while treating a bovine patient.

Dr. Fred C. Wright (San Fran. '10) and Dr. N. D. Cash (K. S. A. C. '25), of Santa Ana, California, opened a small animal hospital in May.

Dr. E. P. Schaffter (Ont. '88), B. A. I. inspector-in-charge at Detroit, Mich., recently addressed the local Kiwanis Club on the subject of "Meat Inspection."

Dr. J. H. Staples (A. P. I. '23) is in general practice at Cuthbert, Ga. He gives one hour each day to the inspection of the local meat and milk supply.

Dr. Frank C. Wilson (Colo. '23), of Deland, Florida, conducts a small animal practice and acts as sanitary officer in the inspection of the local milk supply.

Dr. Paul Dingman (Ont. '27) has returned to Prophetstown, Ill., and has entered practice there in partnership with his father, Dr. R. G. Dingman (McK. '17).

Dr. H. B. Smith (Ga. '25), of Reidsville, N. C., acted in the capacity of principal of the Elementary Consolidated School for six months during the year 1926-27.

Dr. C. J. Durham (Ga. '23) is in practice at Fort Pierce, Fla., where he also looks after the municipal meat, milk, food and dairy inspection, including laboratory work.

Dr. James B. Jones (Wash. '26), who practiced in Hollywood, California, for about eight months following graduation, has opened a veterinary hospital in Spokane, Wash.

Dr. J. Druckerman (O. S. U. '25) has resigned from the service of the Bureau of Animal Industry and is now employed as food inspector by the City of New York.

Dr. Geo. M. Simmons (Iowa '25) has been in charge of the Memorial Hospital of the Society for the Prevention of Cruelty to Animals, San Francisco, Calif., since October 1, 1926.

Dr. H. L. Morency (Colo. '25) has been appointed assistant professor of pathology in the Division of Veterinary Medicine, Colorado Agricultural College, succeeding Dr. W. H. Feldman, resigned.

Dr. Wm. H. Ferguson (Gr. Rap. '05) has been obliged to give up his work with the Michigan Department of Agriculture and has returned to Ionia, Mich., on account of the serious illness of his mother.

Dr. Harry W. Sutton (Corn. '23) is in practice at Unadilla, N. Y., and does considerable accredited herd testing. He also conducts physical examinations of dairies for the Board of Health of New York City.

Dr. D. E. Whatley (Colo. '23), of Topeka, Kans., tuberculin tests between 5000 and 5500 head of dairy cattle supplying milk to the city of Topeka. He does this work in conjunction with his private practice.

Dr. W. E. Muldoon (Corn. '13), of Peru, Ind., addressed the Rotary Club of Wabash, Ind., on May 23rd. Dr. Muldoon has veterinary supervision of all of the animals in a large circus, having its headquarters at Peru.

Dr. Alex. Bishop (Ont. '23) is engaged in general practice in St. Johns, Newfoundland. He is also veterinary advisor to the Department of Agriculture and holds the position of government inspector of cattle and meats.

Dr. N. L. McBride (Chi. '14), of Gibson City, Ill., recently lost his veterinary hospital by fire. Dr. McBride lost about \$500 worth of drugs, his instruments, an operating-table and an ice-box, in which he kept his biological products.

Dr. Dayton M. Warren (O. S. U. '24), who has been a member of the veterinary staff of the State College of Washington the past year, has returned to Urbana, Ohio, where he is again associated with Dr. C. E. Inskeep (Ont. '95).

Dr. E. B. Bennett, Jr. (Chi. '05) has resigned from the meat inspection service of the Bureau of Animal Industry and accepted an appointment to the position of Assistant Chief, in charge of milk inspection, Milwaukee Department of Health.

Dr. C. C. Massie, (K. C. V. C. '13), of Toledo, Ill., has been appointed Henderson County (Ill.) Veterinarian succeeding Dr. Wm. E. LeCroy, who resigned to accept a similar position in Marion County (Ill.), April 1. Dr. Massie started work June 1.

Dr. H. P. Conrad (Mich. '21), who is in charge of the tuberculin testing work being conducted in St. Clair County, Michigan, conducted a party of St. Clair County farmers on a tour of inspection of the Detroit stockyards, June 7, designated as "T. B. Day."

Dr. J. A. McComb (O. S. U. '23), of Macomb, Ill., where he has been engaged in county tuberculosis eradication work for almost three years, has resigned and accepted a position with the Massachusetts State Antitoxin and Vaccine Laboratory, Jamaica Plain, Boston, Mass.

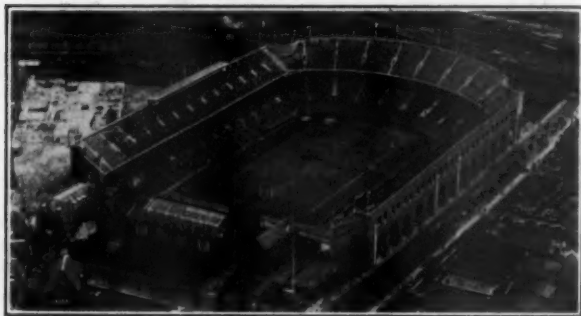
Dr. Walter Wisnicky (K. C. V. C. '26), who has been at the Wisconsin Agricultural College the past year, has accepted a position as Instructor in Poultry Husbandry and Assistant Poultry Husbandman of the Experiment Station, University of New Hampshire, Durham.

Dr. O. F. Butterfield (Chi. '96), of Libertyville, Ill., has purchased the practice of Dr. George Gordon, of Gibson City, Ill., as well as the practice of Dr. N. L. McBride of the same place. Dr. Gordon has removed to Los Angeles, Calif. Dr. McBride's plans for the future are uncertain.

Dr. Harry M. Martin (U. P. '16), a member of the staff of the Department of Animal Pathology and Hygiene of the University of Nebraska, received the degree of Doctor of Philosophy at the recent commencement exercises. His thesis was entitled, "Studies on the *Ascaris Lumbricoides*."

Dr. W. H. Feldman (Colo. '17), for the past ten years assistant professor of pathology in the Division of Veterinary Medicine, Colorado Agricultural College, has accepted the appointment to the place made vacant by the resignation of Dr. J. G. Hardenbergh, at the Mayo Foundation, Rochester, Minn. Dr. Feldman reported for work in his new position on June 10.

***Meet thy friends in the Friendly City—
Philadelphia, September 13-14-15-16***



Franklin Field, University of Pennsylvania.

